Vol. 1011 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 20, 1981

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90-95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,729,680, Re. S.N. 273,371, Filed June 15, 1981, Cl. 455/36, RADIO PAGER WITH VOICE MESSAGE AND SUBSTITUTE PAGING NUMBERS, Ramsey H. McDonald, Owner of Record: *Inventor,* Attorney or Agent: Harold R. Woodard, et al., Ex. Gp.: 233

4,153,174, Re. S.N. 261,623, Filed May 7, 1981, Cl. 215/252, TAMPER-PROOF CLOSURE, Frederick D. Keeler, Owner of Record: *The KLM Co., Stratford, Conn.,* Attorney or Agent: Morris Relson, et al., Ex. Gp.: 241

4,157,724, Re. S.N. 273,040, Filed June 12, 1981, Cl. 141/1, METHOD AND AN APPARATUS FOR DISTRIBUTING A DISINTEGRATED MATERIAL ONTO A LAYER FORMING SURFACE, Torsten B. Persson, Owner of Record: *Inventor,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 243

4,188,103, Re. S.N. 268,781, Filed June 1, 1981, Cl. 354/27, RANGE SYNCHRONIZED FLASH PHOTOGRAPHIC APPARATUS AND METHOD FOR ACHIEVING OPTIMUM FLASH EXPOSURE, Conrad H. Biber, et al., Owner of Record: *Polaroid Corp., Cambridge, Mass.,* Attorney or Agent: David R. Thornton, Ex. Gp.: 211

4,195,953, Re. S.N. 270,721, Filed June 5, 1981, Cl. 405/300, ADVANCE MECHANISM FOR A MINE ROOF SUPPORT ASSEMBLY, Kunibert Becker, et al., Owner of Record: *Gewerkschaft Eisenhutte Westfalia, Lunen, Germany,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 354

4,207,206, Re. S.N. 271,564, Filed June 8, 1981, Cl. 252/429B, CATALYST SYSTEM, Nikolaous K. Balint, Owner of Record: *Standard Oil Co., Chicago, Ill.,* Attorney or Agent: William T. McClain, et al., Ex. Gp.: 117

4,221,751, Re. S.N. 273,266, Filed June 12, 1981, Cl. 264/119, ARTICLES MOLDED FROM PAPERMILL SLUDGE, Bruce A. Haataja, et al., Owner of Record: *Board of Control of Michigan Technological University, Houghton, Mich.,* Attorney or Agent: Gerrit D. Foster, et al., Ex. Gp.: 147

4,249,044, Re. S.N. 271,771, Filed June 8, 1981, Cl. 200/5A, MEMBRANE SWITCH WITH MEANS FOR PREVENTING CONTAMINATION OF THE INTERIOR THEREOF, Willis A. Larson, Owner of Record: *Oak Industries, Inc., Crystal Lake, Ill.,* Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 217

4,257,204, Re. S.N. 263,442, Re. S.N. June 2, 1981, Cl. 52/395, PREFABRICATED INSULATED PANEL AND WALL STRUCTURE PRODUCED THEREFROM, Martin C. Rieger, Owner of Record: *Childers Products Co., Inc., Cleveland, Ohio,* Attorney or Agent: David A. Burge, et al., Ex. Gp.: 354

4,262,138, Re. S.N. 272,519, Filed June 11, 1981, Cl. 560/233, PREPARATION OF CARBOXYLIC ACID ESTERS WITH BF3 COMPLEX CATALYST, Abraham P. Gelbein, Owner of Record: *Chem Systems, Inc., New York, N.Y.,* Attorney or Agent: Bert J. Lewen, Ex. Gp.: 126

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,828,610, Reexam. No. 90/000,073, Requested: Sept. 18, 1981, Cl. 73/862.49, THRUST MEASUREMENT, Judson S. Swearingen, Owner of Record: *Rotoflow Corp., Los Angeles, Calif.,* Attorney or Agent: Browning & Bushman, Ex. Gp.: 244, Requester: Alfred B. Levine, Washington, D.C.

4,031,289, Reexam. No. 90/000,070, Requested: Sept. 18, 1981, Cl. 428/451, STAIN RESISTANT POLYESTER-COATED BLOCK, John A. Sergovic, Owner of Record: *The Burns & Russell Co., Baltimore Md.,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 160, Requester: Trenwyth Ind., Inc., Emigsville, Pa.

4,246,240, Reexam. No. 90/000,071, Requested: Sept. 17, 1981, Cl. 423/139, PROCESS FOR SEPARATING COBALT AND NICKEL FROM A SOLUTION CONTAINING COBALT AND NICKEL, Takashi Ogata, et al., Owner of Record: *Nippon Mining Co. Ltd., Tokyo, Japan,* Attorney or Agent: Wegner & Bretschneider, Ex. Gp.: 110, Requester: John W. Schneller, Washington, D.C.

PATENT NOTICES

Certificates of Correction for the Week of Oct 20, 1981

Re. 30,520	4,256,014	4,270,183	4,278,590
Re. 30,568	4,257,731	4,270,424	4,278,826
Re. 30,585	4,258,479	4,270,824	4,278,866
D. 257,600	4,258,864	4,270,858	4,279,523
4,089,491	4,260,373	4,271,153	4,279,593
4,135,808	4,260,851	4,271,197	4,280,477
4,157,357	4,261,860	4,271,328	4,280,541
4,159,331	4,262,236	4,271,546	4,280,753
4,166,465	4,262,497	4,271,705	4,280,826
4,167,567	4,263,027	4,271,847	4,280,835
4,186,119	4,263,218	4,272,457	4,281,094
4,204,702	4,263,273	4,272,530	4,281,154
4,204,717	4,263,274	4,272,604	4,281,163
4,205,178	4,263,287	4,272,711	4,281,205
4,208,328	4,263,290	4,272,994	4,281,597
4,212,076	4,263,601	4,274,118	4,281,617
4,215,480	4,263,777	4,274,146	4,281,664
4,216,541	4,263,997	4,274,232	4,281,871
4,220,925	4,264,075	4,274,427	4,282,016
4,221,328	4,264,435	4,274,494	4,282,405
4,224,434	4,264,466	4,274,686	4,282,517
4,236,218	4,264,932	4,275,051	4,282,540
4,238,325	4,265,022	4,275,664	4,283,070
4,239,656	4,265,197	4,275,793	4,283,301
4,240,633	4,265,524	4,276,089	4,283,343
4,241,078	4,265,922	4,276,205	4,283,611
4,241,815	4,266,054	4,276,266	4,283,796
4,242,009	4,266,523	4,276,619	4,283,823
4,242,098	4,267,186	4,276,771	4,283,895
4,243,543	4,267,532	4,276,812	4,284,208
4,245,804	4,267,915	4,277,293	4,284,249
4,246,844	4,268,267	4,277,322	4,284,571
4,248,729	4,268,578	4,277,485	4,284,596
4,249,104	4,268,782	4,277,583	4,284,734
4,250,526	4,268,871	4,278,031	4,284,833
4,252,707	4,269,053	4,278,126	4,284,839
4,252,973	4,269,410	4,278,206	4,284,879
4,253,037	4,270,096	4,278,255	
4,255,346	4,270,131	4,278,479	

Disclaimers

4,023,105.—*Kenneth Rau Woolling, Jr.,* Indianapolis, Ind. COUNTER TYPE REMOTE CONTROL RECEIVER PRODUCING BINARY OUTPUTS CORRELATED WITH NUMERICAL COMMANDS OF A COMPANION REMOTE CONTROL TRANSMITTER. Patent dated May 10, 1977. Disclaimer filed Aug. 17, 1981, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

4,074,896.—*Larry G. Eftefield,* Joliet, Ill. CUSHION COMPRESSION STRUTS FOR BULLDOZER BLADES. Patent dated Feb. 21, 1978. Disclaimer filed Aug. 17, 1981, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

4,183,921.—*W. David Weir,* Levittown and *Edward E. Kilbourn,* Chalfont, Pa. PHOSPHONOUREIDE AND PHOSPHONOTHIOUREIDE ANTHELMINTICS. Patent dated Jan. 15, 1980. Disclaimer filed Mar. 31, 1981, by the assignee, *Beecham, Inc.*

Hereby enters this diclaimer to all claims of said patent.

4,203,652.—*Hiroshi Hanada,* Yokohama, Japan BEAM SHAPING OPTICAL SYSTEM. Patent dated May 20, 1980. Disclaimer filed Aug. 28, 1981, by the assignee, *Canon Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1, 2, 17 and 18 of said patent.

4,235,158.—*A. David Johnson, Jr.,* Radnor, Pa. METHOD OF MAKING HIGH STRENGTH SHIPPING CARTON. Patent dated Nov. 25, 1980. Disclaimer filed Aug. 27, 1981, by the aissignee, *Wayne Automation Corp.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

4,239,861.—*Hans-Eberhard Braese; Winfried Fischer; Dietrich Hardt,* Cologne, *Richard Prinz,* Leverkusen; and *Volker Serini,* Krefeld, Germany. POLYVINYL CHLORIDE-POLYCARBONATE ALLOYS. Patent dated Dec. 16, 1980. Disclaimer filed Aug. 28, 1981, by the assignee, *Bayer Aktiengesellschaft.*

Hereby enters this disclaimer to claims 1–9, all claims of said patent.

4,264,429.—*Joel W. Rosenthal,* El Cerrito; *Arthur J. Dahlberg,* Pinole; and *Christopher W. Kuehler,* Larkspur, Calif. TWO-STAGE COAL LIQUEFACTION PROCESS WITH PROCESS-DERIVED SOLVENT. Patent dated Apr. 28, 1981. Disclaimer filed July 27, 1981, by the assignee, *Chevron Research Co.*

The term of this patent subsequent to Mar. 10, 1998, has been disclaimed.

4,278,756.—*Eric W. Bouldin,* Woodside, and *Jerome Drexler,* Los Altos Hills, Calif. REFLECTIVE DATA STORAGE MEDIUM MADE BY SILVER DIFFUSION TRANSFER. Patent dated July 14, 1981. Disclaimer filed Aug. 17, 1981, by the assignee, *Drexler Technology Corp.*

Hereby enters this disclaimer to claims 2, 4, 5, 7, 8 and 9 of said patent.

Dedication

3,414,928.—*Jerome H. Lemelson,* Metuchen, N.J. COMBINATION SPONGE AND SCANNER. Patent dated Dec. 10, 1968. Dedication filed June 11, 1981, by the assignee, *Minnesota Mining and Manufacturing Co.*

Hereby dedicates the remaining term of said patent to the Public.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 5, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-12-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-09-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-12-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-06-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-07-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-23-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-20-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	2-08-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-12-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	2-19-80

Expiration of patents: The patents within the range of numbers indicated below expire during September 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,146,459 to 3,151,328, inclusive

Plant Patents ..... Numbers 2,444 to 2,448, inclusive

Patent and Trademark Office

Taking Effect in the United States of the International Convention for the Protection of New Varieties of Plants

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on November 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after November 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of November 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after November 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director
Office of Legislation and International Affairs
Box 4
U.S. Patent and Trademark Office
Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557-3065.

Date: Oct. 15, 1981.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

REISSUES

OCTOBER 20, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

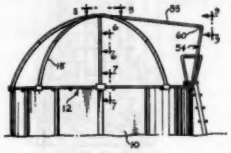
Re. 30,774
LIGHTWEIGHT REMOVABLE COVER FOR A POOL, GREENHOUSE OR THE LIKE

Edwin L. Dahlbeck, and Verna H. Dahlbeck, both of 739 N. 198th, Seattle, Wash. 98133

Original No. 4,136,408, dated Jan. 30, 1979, Ser. No. 744,729, Nov. 24, 1976. Application for reissue Feb. 26, 1980, Ser. No. 124,121

Int. Cl.³ E04H *3/16, 3/18*

U.S. Cl. 4—498 **22 Claims**



12. Apparatus for supporting a flexible cover over an enclosure such as a swimming pool, greenhouse or the like, comprising:

a peripheral lower frame,

a plurality of curved, interconnected tubular supports coupled to the lower frame overlying the enclosure and spaced along the lower frame,

rigid elongated stabilizer members located above the peripheral lower frame and interconnecting said tubular supports, said stabilizer members being attached to the tubular supports on a side remote from the flexible cover so as not to contact the cover,

a flexible cover overlying said supports and stabilizer members for covering the space above the enclosure, and

means for securing the cover to the lower frame.

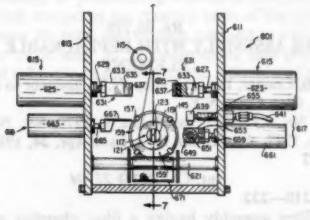
Re. 30,775
AUTOMATIC CAPACITOR WINDING MACHINE AND METHOD

Fredric S. Miller; Armando A. De Mauro, both of Wayne, N.J., and Robert J. Delvy, Bridgeport, Conn., assignors to Universal Manufacturing Corporation, Paterson, N.J.

Original No. 4,003,112, dated Jan. 18, 1977, Ser. No. 562,012, Mar. 25, 1975. Application for reissue Jan. 17, 1979, Ser. No. 4,018

Int. Cl.³ H01G *4/16*

U.S. Cl. 29—25.42 **30 Claims**



1. A method for winding capacitors including:

moving a bifurcated arbor having a slot to a retracted position;

clamping portions of dielectric layers into a substantially planar configuration above said arbor; [retracting said arbor;]

rotating said arbor so that its slot is substantially in alignment with the plane of said dielectric layers;

carrying the planar portion of said dielectric layers into alignment with the axis of said arbor;

maintaining said alignment while extending said arbor axially to an advanced position to grasp said dielectric layers;

rotating said arbor to wind the capacitor;

feeding electrodes from continuous supplies to said rotating arbor;

supplying a relatively thick structural insert while said capacitor is being wound to reinforce the capacitor;

moving said arbor to a retracted position while stripping said capacitor off said arbor.

Re. 30,776
BREAK-OUT APPARATUS FOR FAULT PREVENTION IN THE PRODUCTION OF MULTI-STRAND YARNS

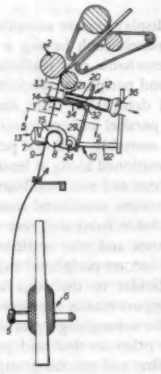
Dieter E. A. Plate, Torquay, and John D. Feehan, Belmont, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Original No. 4,110,963, dated Sep. 5, 1978, Ser. No. 796,790, May 13, 1977. Application for reissue May 6, 1980, Ser. No. 147,016

Claims priority, application Australia, May 13, 1976, 5921/76

Int. Cl.³ D01H *13/16*

U.S. Cl. 57—86 **10 Claims**



20. Apparatus for spinning a two-ply yarn in a single operation from two separate running strands, said apparatus having a drafting unit for drawing said strands in spaced relation to one another from separate rovings and having a rotatable spindle for twisting the drawn strands together and for winding thereon the two-ply yarn so formed, the twisting action being such as to form a distinctive convergence point between the two component strands, wherein twist blocking means are provided in the vicinity of the said convergence point so that, when one strand breaks the other is allowed to adopt a modified line of travel in which it is acted upon by said twist blocking means to substantially block the travel of twist to that portion of said other strand between said means and the drafting unit so as to thereby cause said other strand to also break.

Re. 30,777

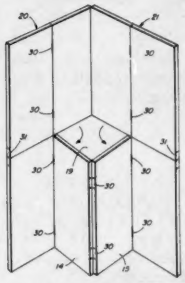
PORTABLE DISPLAY SYSTEM

Willy Ytter, Stockholm, Sweden, assignor to Extraversion, Inc., Dover, Del.

Original No. 4,147,198, dated Apr. 3, 1979, Ser. No. 838,667, Oct. 3, 1977. Application for reissue Oct. 25, 1979, Ser. No. 87,992

Int. Cl.[3] A47G *5/00*

U.S. Cl. 160—135 30 Claims



1. A portable display system comprising:

a plurality of panels each having a detachable front wallboard and detachable rear wallboard;

a first and second peripheral support means to support and position said detachable front and rear wallboard in a substantially parallel and confronting relationship so as to form a panel assembly; said first peripheral support means removably positioned along at least one outer edge of said detachable front and rear wallboard, said second peripheral support means positioned along the remaining edges of said detachable front and rear wallboard so that said detachable front and rear wallboard is removable from said first and second peripheral support means in a direction perpendicular to the edge along which said first peripheral support means is positioned,

hinging means for connecting a plurality of said panel assemblies to each other so that said panel assemblies are divided into a first and second group;

said hinging means comprising a plurality of corner hinges greater than two and a plurality of double hinges greater than two so that said corner hinges are connected to a plurality of said panel assemblies movable in a vertical direction and said double hinges connected to a plurality of said panel assemblies movable in a horizontal direction,

said first and second group comprising a number of connected panel assemblies such that said number of connected panel assemblies are hinged in the said two directions so that in the extended position the number of panel assemblies extending in the vertical direction equals the number of panel assemblies extending in the horizontal direction,

said first group being extended to said position independent of said second group.

Re. 30,778

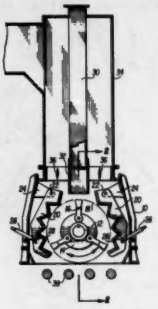
CRUSHER-DRYER AND METHOD OF CRUSHING

William F. Hahn, Devon; Joseph P. Nigro, Villanova, and Frank Wallitsch, Jr., Center Valley, all of Pa., assignors to Pennsylvania Crusher Corporation, Broomall, Pa.

Original No. 4,085,897, dated Apr. 25, 1978, Ser. No. 816,828, Jul. 18, 1977. Continuation of Ser. No. 746,379, Dec. 1, 1976, abandoned. Application for reissue Apr. 23, 1980, Ser. No. 142,957

Int. Cl.[3] B02C *23/24*

U.S. Cl. 241—18 48 Claims



1. An improved apparatus for crushing and drying materials, such as moist coal, comprising:

a housing having an inlet opening located [;] in the upper portion thereof and an outlet opening located in the lower portion thereof;

a rotor mounted for rotation in said housing, said rotor having impact members thereon for striking and crushing material falling through said inlet opening and passing through the impact circle defined by the outer extremities of said impact members;

a first inlet duct means entering said inlet opening and terminating a short distance above said [hammer] *impact* circle, for causing said material to drop through said inlet opening above said impact circle to be struck by said impact members;

a second inlet duct means entering said inlet opening for conveying hot air into said housing without substantially [interfereing] *interfering* with said material until just prior to entry of said material into said impact circle;

at least one breaker plate mounted within said housing in position to be impacted by material thrown off by said impact members; and

means located within said second inlet duct for selectively directing the flow of hot air through said second inlet duct to pass between said breaker plate and said rotor; behind said breaker plate; or both.

Re. 30,779

FILTER ASSEMBLY WITH REPLACEABLE FILTER ELEMENT

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

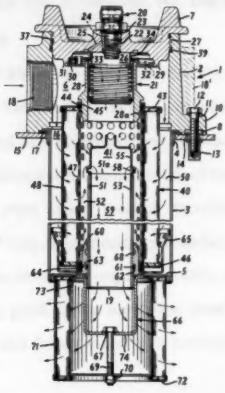
Original No. 4,133,763, dated Jan. 9, 1979, Ser. No. 856,959, Dec. 5, 1977. Application for reissue Apr. 24, 1980, Ser. No. 143,227

Int. Cl.[3] B01D *27/04*

U.S. Cl. 210—232 28 Claims

1. A filter assembly having a filter chamber and a filter element therein that is replaceable without contamination of filtered fluid with unfiltered fluid in the filter chamber even though the filter chamber is not emptied of unfiltered fluid when a filter element is removed and installed, comprising, in combination, a filter housing; a filter chamber in the housing;

an inlet for unfiltered fluid and an outlet for filtered fluid in the housing; a filter element removably disposed in the filter chamber across the line of fluid flow from the inlet to the outlet so that fluid flow from the inlet to the outlet normally proceeds through the filter; a weir spaced from and downstream of the filter element, compelling filtered fluid from the filter flowing towards the outlet to proceed upwardly through the space between the weir and the filter and then by overflow across the weir; and a weir follower operatively associated with the base of the filter element [and] *removably attached to one end of the*



filter element and mounted on the weir in a manner to be retained thereon while a used filter element is being removed, and while a clean filter element is being installed, and slidably movable along the weir in fluid-tight relation to the base and the weir, to carry filtered fluid in the space between the weir and the filter element on the downstream side of the filter element to the top of the weir while a used filter element is being removed, and to displace unfiltered fluid in the filter chamber from contact with the downstream side of a clean filter element while the clean filter element is being installed.

Re. 30,780

HEAT TREATMENT OF HEAT-SENSITIVE PRODUCTS

Lennart A. Stenstrom, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Original No. 3,814,889, dated Jun. 4, 1974, Ser. No. 176,966, Sep. 1, 1971. Application for reissue Jul. 31, 1978, Ser. No. 929,668

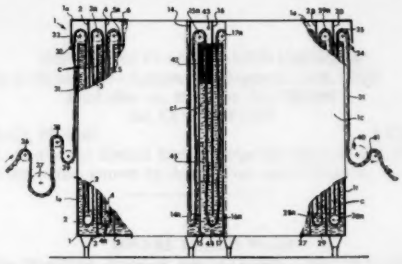
Claims priority, application Sweden, Sep. 8, 1970, 12153/70

The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.

Int. Cl.³ H05B *6/78*

U.S. Cl. 219—10.55 M **11 Claims**

1. In the processing of a heat-sensitive product by subjecting it to a sterilizing or pasteurizing treatment temperature, the method which comprises pre-treating units of the product by heating at least the main part of each said unit to a pre-heating temperature of at least 50° C. *interrupting said pretreatment heating*, and subjecting each unit to the influence of a cooling medium to prevent the surface layer of said unit from acquiring a substantially higher pre-heating temperature than the inner



parts of said unit, and then heating each product unit to substantially said treatment temperature by subjecting the unit to electromagnetic energy of at least microwave frequency.

Re. 30,781

LOGARITHMIC AMPLIFIER

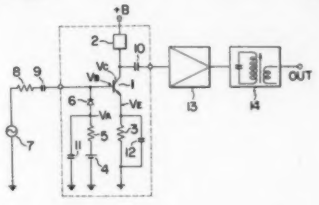
Yukihiko Miyamoto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Original No. 4,209,714, dated Jun. 24, 1980, Ser. No. 806,098, Jun. 13, 1977. Application for reissue Aug. 15, 1980, Ser. No. 178,457

Claims priority, application Japan, Jun. 14, 1976, 51-69605

Int. Cl.³ H03K *5/08*; G06G *7/12*

U.S. Cl. 307—490 **5 Claims**



1. A logarithmic amplifier circuit comprising at least one transistor connected in a common-emitter amplifier arrangement, said transistor having base, collector and emitter electrodes, said emitter electrode being connected to ground through a resistor, said collector electrode being connected to a power source through a load and providing an output signal, said base electrode being connected to a bias voltage source through a diode and to an input signal source, said diode and the base-emitter junction of the transistor cooperating to rectify the input signal from said signal source and comprising means to impart a logarithmic input-amplitude-level-to-output-amplitude-level transfer characteristic to the amplifier circuit for a predetermined amplitude range of input signals.

PLANT PATENTS

GRANTED OCTOBER 20, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,778

GERANIUM PLANT

Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 5, 1980, Ser. No. 175,751
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct geranium plant, a hybrid of the genus Pelargonium, L'Her., to be known by the cultivar name Songster, as described and illustrated, and particularly characterized by the combination of characteristics of orange-red flower color; medium plant height; medium internode length; semi-double flower form; semi-spreading branching pattern; mid-season spring-pot flowering response; prolific outdoor summer flowering traits; good foliage durability; good flower durability; and dark green foliage color with pronounced dark zonation.

4,779

IMPATIENS PLANT NAMED CHINOOK

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed May 16, 1980, Ser. No. 150,699
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name Chinook.

4,780

DWARF PEACH W-114

Fedor Wassiliew, deceased, late of Orange, Calif.; by Nicolaus Wassiliew, heir, Costa Mesa, Calif.; by Alexander Wassiliew, heir; by Marsha W. Hartman, heir, both of Orange, Calif., and by Valentina Wassiliew, heir, Costa Mesa, Calif., assignors to Jackson & Perkins Co., Medford, Oreg.

Filed May 1, 1980, Ser. No. 145,510
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree of the genetically dwarf type, substantially as herein shown and described, characterized particularly as to novelty by its unique combination of vigorous, dwarf plant, semi-double pink flowers, late July ripening date, nearly spherical, red flushed yellow fruit skin, and sweet yellow flesh.

PATENTS

GRANTED OCT. 20, 1981

ERRATA

For CLASS	See PATENT NO.
474–083	4,295,383
501–090	4,295,890
501–099	4,295,891
501–120	4,295,892
376–203	4,295,934
376–285	4,295,935
073–864	4,296,071

PATENTS

GRANTED OCT. 20, 1981

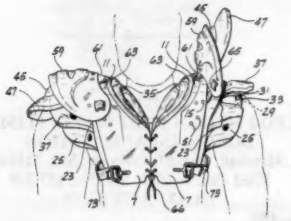
ERRATA

PATENTS

GRANTED OCTOBER 20, 1981

GENERAL AND MECHANICAL

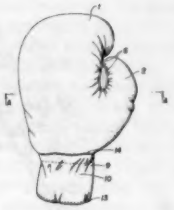
4,295,227
SHOULDER PAD
Hal D. Mitchell, Rolla, Mo., assignor to A-T-O Inc., Willoughby, Ohio
Filed Apr. 25, 1980, Ser. No. 143,899
Int. Cl.[3] A41D *13/00*
U.S. Cl. 2—2 **7 Claims**



1. A shoulder pad for football players comprising a left-hand member adapted to fit over the left shoulder and a right-hand member adapted to fit over the right shoulder, each of said members being a relatively rigid member of generally inverted U-shape as viewed from the side and having a chestplate portion, a backplate portion and an arch integrally connecting said plate portions, said arches being laterally spaced to provide an opening for the neck of the wearer with the spacing such that said arches lie adjacent and relatively close to the neck, each of said members having padding on the inside thereof with the padding at the top of the arch comprising an inner portion generally beneath the arch adapted to overlie the inner part of a respective shoulder and an outer portion extending laterally outwardly beyond the arch adapted to overlie the outer part of said shoulder, said outer portion comprising a front section adjacent the chestplate portion and a back section adjacent the backplate portion, said front and back sections being separate toward their outer ends for allowing the sections to spread apart upon upward movement of the arm at the shoulder, each member further comprising a cover pad extending laterally outwardly from said inner portion of the arch padding over the separate outer ends of said front and back sections of the arch padding at the top of the shoulder, said cover pad being hinged to the inner portion of the arch padding for permitting the cover pad to swing upwardly on upward movement of the arm at the shoulder, and a cap with padding on the inside thereof overlying said cover pad and adapted to fit over the outer part of the shoulder.

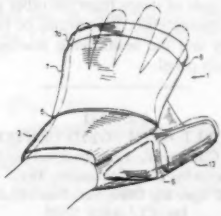
4,295,228
BOXING GLOVES WITHOUT A SEAM ON THE FRONTAL STRIKE PORTION THEREOF
Stojicic Dragomir, Jurija Gagarina 211/9, 11070 Novi Beograd, Yugoslavia
Filed Dec. 28, 1979, Ser. No. 107,973
Claims priority, application Yugoslavia, Jan. 17, 1979, 18/79
Int. Cl.[3] A41D *13/10*
U.S. Cl. 2—18 **3 Claims**

1. A boxing glove comprising a frontal strike portion, a palm portion and a thumb portion, wherein said frontal strike portion and thumb portion represent a unitary piece and are slanted inwardly in a convex manner towards said palm portion and wherein said frontal portion and said thumb portion are mutually joined in said palm portion by fabric seams inwardly tucked at the point where (1) the interior of said thumb section interconnects with said palm portion; (2) said frontal strike portion at the opposite extreme from said thumb side interconnects with said palm portion and (3) said convexly situated frontal strike portion interconnects with the top portion of said palm portion, said interconnections comprising the



attachment of at least two separate ply fabrics and wherein said attachment provides an open interconnection of stuffing between the interiors of said frontal strike portion and said thumb portion.

4,295,229
FOOTBALL GLOVES
Eugene A. Clark, 27 Blen Cathia Hill, R.R. 2, Gormley, Ontario, Canada (L04 1G0), and Morris Zubkewych, 2184 D Bloor St. W., Toronto, Ontario, Canada
Filed Feb. 19, 1980, Ser. No. 122,418
Int. Cl.[3] A41D *13/08*
U.S. Cl. 2—20 **8 Claims**



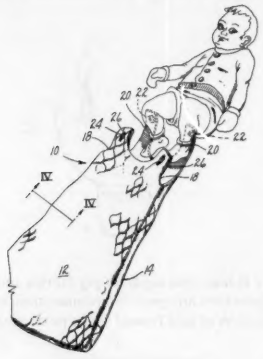
1. A football glove including an upper pad arrangement comprising a wrist protecting portion and a hand protecting portion integrated with one another with said hand protecting portion being partially open from beneath for palm, finger and thumb exposure below said pad arrangement, said hand protecting portion being provided with finger and thumb pads of a length such that there is at least first phalange finger and thumb coverage from above by said finger and thumb pads, inelastic web means connecting the thumb pad to the finger pads to limit movement of said thumb pad away from said finger pads, individual finger and thumb receptacles beneath said finger and thumb pads, said receptacles being adapted for limited stretching thereof to enable ready finger and thumb manipulation and being provided with restraining means for restraining excessive stretching of said receptacles to reduce finger and thumb injuries, said pad arrangement being provided with a plurality of transverse flexible joints along its length to permit flexing of the glove in said hand protecting portion and between said hand protecting portion and said wrist protecting portion and separate securing means at both said hand protecting portion and said wrist protecting portion to secure said glove in position from beneath said pad arrangement.

4,295,230

CHILDREN'S SLEEPING GARMENTS

Camille C. Blodgett, P.O. Box 202, West Stockbridge, Mass. 01266

Filed Apr. 14, 1980, Ser. No. 139,871
Int. Cl.³ A41D *11/00*
U.S. Cl. 2—69.5 **2 Claims**



1. A sleeping garment comprising front and rear unitary panels connected by a single seam extending around bottom and side edges of the panels, each panel terminating at its upper end in a pair of unitary shoulder straps, one shoulder strap from each panel being detachably connectible to the strap from the other panel, the upper ends of the panels being contoured together to form a pair of arm holes closed only by the shoulder straps and adapted to leave the upper body of the occupant free of restraint said pair of straps from one of the panels being connected to the pair of straps from the other panel by button and buttonhole connections, the margins of the panels being turned outwardly and the seam being inserted through two thicknesses of each panel.

4,295,231

FILIGREED BELT WITH SOLID CENTER PORTION

Earl R. Wright, Comanche, Tex., assignor to Wright Leather Goods Manufacturing Co., Comanche, Tex.

Filed Apr. 14, 1980, Ser. No. 140,314
Int. Cl.³ A41F *9/00*
U.S. Cl. 2—338 **8 Claims**

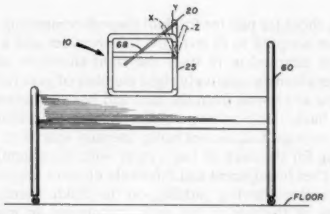
1. A belt to be worn by a person comprising:
an outer layer attached to second layer means,
said outer layer facing outward when the belt is worn by a person,
design openings formed through said outer layer forming part of a design,
said design openings being spaced inward from the opposite edges of said outer layer whereby said opposite edges comprise strips extending along the length of said belt free from said design openings,
said design openings being spaced outward on opposite sides of a central portion of said outer layer extending along at least a part of the length of said belt whereby said central portion is free from said design openings,
the remainder of said design being formed on said central portion by lines or markings,
said belt having a buckle at one end,
said design openings and said central portion extending at least to said one end of said belt and to an end opposite said one end, and
spaced apertures formed through said belt and hence through said central portion of said outer layer at said end opposite said one end of said belt for receiving the tongue of the buckle when the belt is worn by a person.

4,295,232

DEVICE FOR HUMAN BODY WASTE ELIMINATION DURING INCAPACITATION

Jeweral E. Marshall, Box 57, Oldtown, Md. 21555

Filed Jun. 9, 1980, Ser. No. 157,328
Int. Cl.³ A47K *11/06*
U.S. Cl. 4—480 **4 Claims**



1. A device for human body waste elimination, during incapacitation, comprising:
a chair-like structure;
a back rest structure, said back rest structure consisting of a pair of support members, said support members being movably affixed to said chair-like structure, said support members having a plurality of slots therein;
a leg support member for a user, said leg support member having a pair of crescent-like depressed areas therein, each said depressed area providing a holding means for one of the legs of a user, said leg support member being removably and adjustably affixed to said pair of support members in a matching pair of said plurality of slots in said pair of support members;
a pair of pivot means, said pivot means movably affixing said pair of support members to said chair-like structure;
a pair of locking means, said locking means being affixed to said pair of support members and removably affixed to said chair-like structure, said locking means being capable of locking said pair of support member means with said leg support member in a plurality of adjustable positions;
a pair of latching means, said latching means being movably affixed to said chair-like structure to latch said back rest structure into a back-rest position for said chair-like structure;
a bed pan holding means, chair-like structure having a plurality of slots therein, said plurality of slots providing a means for said bed pan holding means being adjustably and removably located within said chair-like structure;
a toilet seat, said toilet seat being affixed to said bed pan holding means; and
a bed pan, said bed pan being used in association with said chair-like structure.

4,295,233

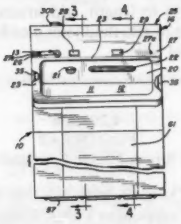
AUTOMATIC HAND WASHER AND DRIER

Lester H. Hinkel, Benton Harbor, and Lawrence E. Wolske, St. Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 866,175, Dec. 30, 1977, abandoned. This application Nov. 13, 1979, Ser. No. 93,906

Int. Cl.³ A47K *1/04, 5/06, 10/48;* E03C *1/14*

U.S. Cl. 4—619 **15 Claims**



1. A hand washing and drying device comprising:

a bowl defining an upwardly and forwardly opening hand washing and drying space, said bowl including a rear wall having a downwardly facing portion and having an upper substantially planar narrow rim extending at a substantial angle to the horizontal for deterring persons from sitting on said rim, said bowl further having a bottom drain underlying said rear wall portion;

water supply means including a water heating tank mounted closely adjacent said rear wall of the bowl and having an outlet opening substantially vertically downwardly generally toward said drain through said rear wall portion inwardly adjacent said rim for supplying wash water into said space in a first direction away from said rim, said outlet being spaced above the lowermost level of the rim; and.

air moving means including a blower mounted closely adjacent said rear wall of the bowl and having a horizontally elongaged outlet opening across said space through said rear wall portion adjacent said rim and at the level of said water supply means outlet for supplying hand drying air across said space in a second direction generally parallel to said rim.

4,295,234

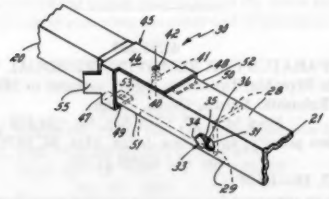
BED FRAME

Larry W. Whitehead, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jan. 28, 1980, Ser. No. 116,220

Int. Cl.³ A47C *19/04*

U.S. Cl. 5—184 **6 Claims**



1. A bed frame including a pair of side rails interconnected by a pair of adjustable elongated cross rail assemblies, said cross rail assemblies being fastened transversely between said pair of side rails so as to hold said side rails in spaced parallel relationship, each of said adjustable cross rail assemblies comprising,

a pair of cross rails connected at one end to one of said side rails, each of said cross rails being L-shaped in cross section and having mutually perpendicular flat legs,

one of said cross rails having a first shouldered protrusion extending from one leg thereof, the other of said cross rails having a plurality of longitudinally spaced slots adapted to receive said shouldered protrusion when said cross rails are located in any one of a plurality of overlapping face abutting positions of adjustment, said slots being configured so as to permit relative longitudinal movement of said first protrusion within said slots,

one of said cross rails having a second protrusion extending from a leg thereof, the other of said cross rails having a plurality of longitudinally spaced apertures adapted to receive said second protrusion when said cross rails are located in any one of the plurality of overlapping positions of adjustment, said apertures being sized and configured so as to prevent relative longitudinal movement of said rails when said second protrusion is located within one of said apertures,

said first and second protrusions extending from mutually perpendicular legs of said cross rails, and

clamping means for locking said cross rails in one of said plurality of positions of adjustment.

4,295,235

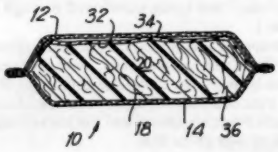
WATERPROOF CUSHION FOR OUTDOOR USE AND METHOD FOR MANUFACTURING THE SAME

Bernard Deitz, West Orange, N.J., assignor to Deitz Plastic Formers, Prospect Park, N.J.

Filed Jan. 28, 1980, Ser. No. 115,871

Int. Cl.³ A47C *27/14;* A47G *9/00*

U.S. Cl. 5—473 **7 Claims**



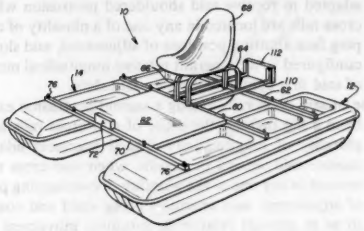
1. In a furniture cushion for outdoor use of the type including a pair of opposed side layers, each formed of woven fabric material, and attached to each other along their respective peripherally extending regions to define an interior space therebetween and a filler material located substantially throughout said interior space, the improvement comprising: said fabric material is formed of filaments at least the outer surfaces of which comprise thermoplastic material, a thin interlayer formed of water impervious plastic material having a peripherally extending edge region interposed between peripherally extending edge regions of said pair of opposed side layers, said peripherally extending edge regions of said side layers and interlayer being heat sealed to each other to form a continuous seal band extending around the entire periphery of the cushion, said interlayer extending entirely through said interior space to divide the latter into a pair of adjacent isolated chambers separated by said interlayer and wherein said filler material is located entirely in one of said chambers such that said interlayer is contiguous with the inner surface of one of said side layers and spaced from the inner surface of the other of said side layers by said filler material.

4,295,236

PONTOON BOAT

Lonnie W. Upchurch, Irving, Tex., assignor to Advanced Marine Concepts, Inc., Arlington, Tex.

Filed Jan. 12, 1979, Ser. No. 2,878
Int. Cl.³ B63B *7/04*
U.S. Cl. 9—2 S **9 Claims**



1. A relatively small watercraft for one or more persons, comprising:

(a) a pair of spaced and generally parallel pontoons, each of which consists of an elongated body of closed-cell foamed plastic, with the body having a longitudinal axis and a length of at least 2 meters and having a generally square cross-section as viewed in a transverse direction;

(b) a load-distribution truss provided on top of each of the foamed cell bodies for transferring vertical loads, and said trusses having a length and width so as to distribute loads across the top of the foamed cell bodies in an approximately uniform manner;

(c) a personnel station adapted to carry at least one person above and generally between the two spaced pontoons, and said station having a width which is sufficiently narrow so as to restrict the center of gravity of personnel on said station to a space which lies internally of the longitudinal axes of the pair of pontoons;

(d) a structural frame for transferring loads from the personnel station to the load-distribution trusses, with at least some of said loads being transferred through a plurality of bolts; and

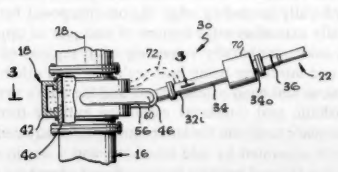
(e) a waterproof and generally puncture-resistant skin for each of the pair of pontoons, with a given skin being installed between the structural frame and the load-distribution truss of a respective pontoon in such a way that the structural frame is external and the load-disribution truss is internal of said given skin.

4,295,237

HOSE ARM COUPLING FOR UNDERWATER FLUID SWIVEL

George M. Pomonik, Van Nuys, Calif., assignor to Amtel, Inc., Providence, R.I.

Filed Nov. 20, 1978, Ser. No. 961,991
Int. Cl.³ B65B *3/04*
U.S. Cl. 9—8 P **4 Claims**



1. In a mooring and cargo transfer installation which includes a product distribution unit having a stationary portion coupled to the sea floor and a rotatable portion rotatable without limit about a vertical axis for coupling through a hose to a vessel that may drift thereabout, the improvement comprising:

a pair of horizontally-spaced flanges fixed to the outside of said rotatable portion of the product distribution unit;

a fluid joint having a member pivotally coupled to said flanges to pivot about a substantially horizontal axis extending through said flanges and lying outside said rotatable portion of said product distribution unit; and

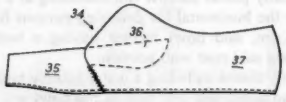
an elongated rigid structure which includes a fluid conduit extending along its length, said structure having an inner end connected to said fluid joint member and an outer end coupled to said hose.

4,295,238

FOOTWEAR

Lancelot P. Clark, Street, England, assignor to Clarks Limited, Street, England

Filed Nov. 16, 1979, Ser. No. 94,921
Claims priority, application United Kingdom, Nov. 17, 1978, 45098/78
Int. Cl.³ A43D *9/00*; A43C *13/08*; A43B *23/00*
U.S. Cl. 12—142 RS **3 Claims**



1. A method of making an article of footwear comprising pre-forming from flexible sheet material a component which provides a sock for underlying the foot and one part of an upper, which part comprises two side panels to extend respectively along opposite sides of the foot, the sock and side panels being formed either integrally with each other or in separate pieces which are connected together to form said component, placing said component on a last which defines the internal shape of the finished article, then enclosing the last and said component in a cavity mould having within it sealing knife edges which serve to nip said part of the upper to the last at locations adjacent but spaced from the edges of said part of the upper and to close the cavity of the mould, said cavity mould being shaped in relation to the last and said component to define therewith a sole unit and, integrally with the sole unit, the remaining part or parts of the upper, and injecting into the mould cavity a plastics material in a settable liquid form thereby in a single moulding operation to form the sole unit of the article and the remaining part or parts of the upper, the plastics material also overlying edge portions of said one part of the upper on the outer face thereof.

4,295,239

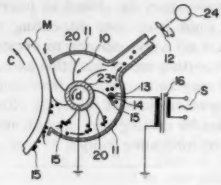
APPARATUS FOR REMOVING RESIDUAL TONER

Hisashi Myochin, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 27, 1980, Ser. No. 134,578
Claims priority, application Japan, Mar. 30, 1979, 54-38662
Int. Cl.³ G03G *21/00*
U.S. Cl. 15—1.5 R **5 Claims**

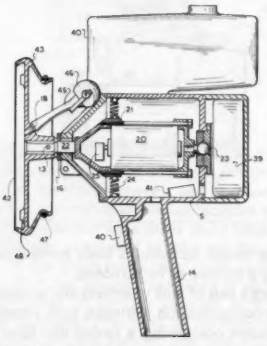
1. In an apparatus for removing residual toner from a surface to be cleaned which comprises a rotatable cleaning brush in frictional engagement with the surface for removing residual toner therefrom, a dusting bar disposed in abutting relation to brush bristles of said cleaning brush for dusting toner off said brush bristles, both said dusting bar and said brush bristles

being made of electrically conductive material with at least one covered with an insulating material, and means for forming



an alternating electric field between said brush bristles and said dusting bar.

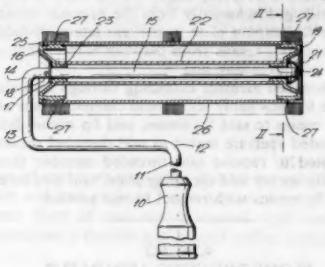
4,295,240
CLEANING DEVICE
Franz Lex, Annenstrasse 6, A 8020 Graz, Austria
Filed Aug. 27, 1979, Ser. No. 70,317
Claims priority, application Austria, Apr. 9, 1978, 6365/78
Int. Cl.³ A46B *13/04*
U.S. Cl. 15—22 R **5 Claims**



1. A cleaning device comprising a housing having an axis and guide means at one end of the housing, a cleaning body to be pressed against an object to be cleaned in a working direction, a drive part glidingly arranged in the guide means, the cleaning body being mounted on the drive part and being driven thereby, and a driving system for driving the drive part and the cleaning body mounted thereon in an oscillatory manner, the driving system including a drive motor having an axis and two ends, a shaft axially extending from one one of the motor ends, a flywheel mass mounted on the motor shaft for generating an oscillatory motion, means for transmitting the oscillatory motion to the drive part, means mounting the drive motor in the housing for oscillation, the mounting means being arranged at one of the motor ends adjacent the drive part, and means for pivotally mounting the other end of the motor in the housing.

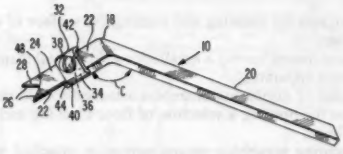
4,295,241
PAINT ROLLER
Kenneth W. Woolcock, Rouse Hill, Australia, assignor to Rota Cota Pty. Ltd., New South Wales, Australia
Filed Apr. 15, 1980, Ser. No. 140,491
Int. Cl.³ B05C *17/02*
U.S. Cl. 15—230.11 **4 Claims**

1. A paint roller comprising a handle, an axle attached to said handle extending at right angles to the axis of the handle and approximately symmetrically on either side thereof, rotatable plastic end caps mounted on the axle ends having outer cylindrical sections to receive and support the base tube of a paint roller cover in the inner surface thereof, a plurality of circumferentially spaced external longitudinal ribs on said cylindrical sections, said ribs functioning when a base tube is pushed over said end caps to distort said outer cylindrical sections of said end caps so that said ribs are deflected inwardly and the mid areas of said cylindrical sections between each pair of ribs are deflected outwardly to contact the inner surface of said base tube, thereby increasing the rigidity of said ribs already in



contact with the said inner surface and enabling a base tube having manufacturing tolerance variations of its inner diameter to have a frictional fit on a major part of each outer cylindrical section of said end caps while being held firmly and ensuring that the base tube and end caps rotate together and at the same time permitting easy installation and removal of the base tube, and means at each end of the axle to retain said end caps on said axle, said end caps constituting the only connection between the base tube and the axle.

4,295,242
CORNER BEADING CLEANER
William Dixon, Rte. #2, Box 2009, Circle Dr., Browns Mills, N.J. 08015
Filed May 5, 1980, Ser. No. 146,712
Int. Cl.³ B05C *17/10*
U.S. Cl. 15—235.7 **10 Claims**



10. A corner beading cleaner, being particularly adapted to shape hardened joint compound adjacent convex corner beadings, said corner beading cleaner comprising:

(a) a body section further including:

(1) a handle means adapted to be grasped by the user; and

(2) a lip means extending outwardly from said handle means and being integral therewith, said lip means extending outwardly from said handle at an angle of approximately 135 degrees with respect thereto; and

(b) a tool means detachably secured to said lip means of said body section, said tool means including two first blade edges extending outwardly therefrom at an angle of 80 to 90 degrees with respect to one another to form a cutting surface of 80 to 90 degrees, said tool means further including two second blade edges extending outwardly therefrom at an angle of 80 to 90 degrees with respect to one another to form a cutting surface of 80 to 90 degrees, said tool means defining a first arcuate concave edge at the intersection between said first blade edges and a second arcuate concave edge at the intersection between said second blade edges; and

(c) a securement means adapted to detachably secure said tool means with respect to said lip means of said body section, said securement means further including;

(1) a clamping plate extending laterally across said lip means of said body section and adapted to receive said tool means between said clamping plate and said lip means to fixedly hold said tool means in place with respect to said body section when said clamping plate is secured to said lip means, said clamping means further including a first ear means and a second ear means extending downwardly from the opposite lateral sides of said clamping plate to prevent lateral dislodgement of said tool means from between said clamping plate and said lip means; and

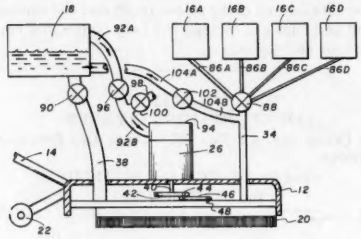
(2) a threaded member extending through said clamping plate to detachably secure said clamping plate and said tool means to said lip means, said lip means defining a threaded aperture mated to said threaded member and adapted to receive said threaded member therein to fixedly secure said clamping plate, said tool means and said lip means with respect to one another.

4,295,243

FLOOR TREATING APPARATUS

Virginia B. King, P.O. Box 5274, 7528 Popen Dr., Knoxville, Tenn. 37918

Filed Oct. 15, 1979, Ser. No. 84,888
Int. Cl.³ A47L *7/00, 11/205*
U.S. Cl. 15—320 **6 Claims**



1. Apparatus for cleaning and treating the surface of a floor comprising:

a carriage means having a handle for guiding and maneuvering said apparatus;

a plurality of dispensing chambers attached to said carriage means for holding a selection of floor cleaning and treating fluids;

reciprocating scrubbing means moveably attached to said carriage means and suitable for use with said selection of fluids for cleaning and treating said floor surfaces;

first transporting means connected to said dispensing chambers and a front portion of said scrubbing means for transporting a selected fluid from said dispensing chambers to said scrubbing means, said first transporting means including a first cut off valve cooperating with said transporting means for selectively interrupting the flow of said selected fluid to said scrubbing means;

a receiving chamber attached to said carriage means suitable for receiving any excess of said selected fluids used for treating said floor surfaces;

vacuum means for creating a vacuum at said receiving chamber;

second transporting means connected between a rear portion of said scrubbing means and said receiving chamber such that said vacuum at said receiving chamber is applied to said second transporting means for transporting excess cleaning or treating fluid from said rear portion of said scrubbing means to said receiving chamber;

a third transporting means having a first end and a further end and a second cut off valve between said first end and said further end, said third transporting means connected to said receiving chamber at said first end and to said first transporting means at said further end such that said first cut off valve may be closed to interrupt the flow of a selected fluid from said dispensing chambers and said second cut off valve opened to create a vacuum at said first transporting means such that excess cleaning or treating fluid may be transported from said front part of said scrubbing means to said receiving chamber; and

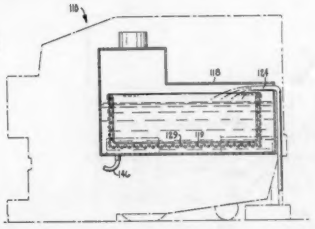
power means for driving said vacuum means and for imparting said reciprocating motion to said scrubbing means.

4,295,244

SCRUBBING MACHINE WITH WATER REGENERATION

Ferdinand J. Herpers, Minnetonka; Harley E. Kroll, Chaska; Alfred D. Carlson, Minneapolis, and Paul D. Dodge, Apple Valley, all of Minn., assignors to Tennant Company, Minneapolis, Minn.

Division of Ser. No. 916,929, Jun. 19, 1978, Pat. No. 4,194,263.
This application Nov. 19, 1979, Ser. No. 95,343
Int. Cl.³ A47L *11/20*
U.S. Cl. 15—320 **8 Claims**



1. A scrubbing device including a body portion suitable for movement along a surface to be scrubbed;

a tank including a pair of tank chambers and separator means providing communication between said chambers, said separator means comprising a basket-like filter member, said separator means being capable of separating a dirty scrubbing solution into a clean solution portion and a solid matter portion, said clean portion being fed into one of said tank chambers, said basket-like filter member comprising a mesh basket and a box-like filter member being spaced from the bottom of said tank, thereby providing a first tank chamber outside said basket-like filter member and a second tank chamber within said basket-like filter, said tank including means cooperating with said basket-like filter member to prevent downward movement of said basket-like filter member, and to concurrently preclude any resistance against upward movement of said basket-like filter member to thereby allow said basket-like filter member to be readily removable at all times for dumping the used box-like filter.

4,295,245

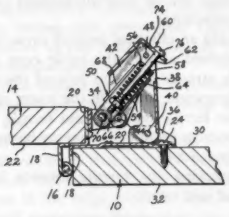
COMBINATION HINGE AND OVERCENTER CLOSURE FOR A DOOR

George E. Malcom, 55356 County Rd. 15 South, Elkhart, Ind. 46514

Continuation of Ser. No. 929,857, Jul. 31, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,985
Int. Cl.³ G05F *1/12, 1/14*
U.S. Cl. 16—80 **2 Claims**

1. In a combination hinge and overcenter retainer connecting a door having front and rear faces separated by a side edge to a frame having a front face and an adjoining side face wherein said hinge includes first and second legs mutually

connected for pivotal movement and first and second connector plates, said first connector plate joined to said first leg, said second connector plate joined to said second leg, said first connector plate secured to the rear face of said door with said first leg extending along said door edge, said second connector plate secured to the side face of said frame with said second leg extending forwardly of said frame front face whereby said door is pivotal about said legs pivot connection for movement between open and closed positions, said overcenter retainer including a flange connected to each hinge connector plate, a first said flange projecting outwardly from said first connector plate at said frame side face, a second said flange projecting outwardly from said second connector plate at said door rear face, a first link pivotally connected at one end to said first flange and a second link pivotally connected at one end to said second flange, said links pivotally connected together at their respective opposite ends, expansion means pivotally connected between one of said flanges spaced from the pivot connection of the link thereto and such link next to its pivot connection to the other link, said expansion means for applying a yieldable



biasing pull between said one flange and its connected link to urge said door into its closed and open positions upon manual movement of the door between said positions, the improvement wherein said expansion means includes a retainer and an adjustment member having a shank and a head, one end of said retainer pivotally connected to said one flange at a location spaced from the pivot connection of its connected link, the opposite end of said retainer receiving in sliding cooperation the shank of said adjustment member with the adjustment member head located exteriorly of the retainer, spring means extending between said retainer and said adjustment member shank in compression for causing said adjustment member head to be yieldably drawn toward said retainer, said adjustment member secured at its head to said one flange connected link adjacent its pivot connection to said other link, said adjustment member shank including means associated with said spring means for varying the compression of the spring means upon rotation of said adjustment member shank whereby the force exerted by said expansion means upon said door in its open and closed positions can be varied.

4,295,246

KNOB

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Filed Apr. 18, 1980, Ser. No. 141,575
Int. Cl.³ F16D *1/06*
U.S. Cl. 16—121 **2 Claims**

1. A molded knob of the type which frictionally engages and slips over the end of a shaft of generally circular cross section and having at least one longitudinally extending flat surface,

a hub formed as part of said knob,

a shaft receiving walled socket formed in said hub,

said socket having a flat wall adapted to engage a flat surface on said shaft, and

a resilient finger formed as part of said hub and extending into the socket from said flat wall,

said resilient finger being positioned to engage an arcuate side of said shaft at a location adjacent said flat wall when said shaft is inserted into said socket to slightly deform said resilient finger and thereby apply force to said shaft, and

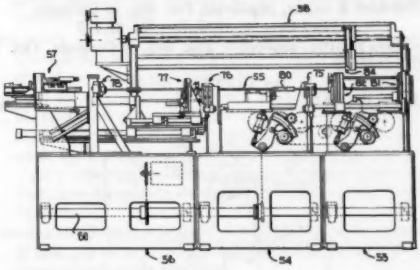
the wall of the socket located opposite the flat wall is a rigid part of a semi-hexagonal walled socket, the circular portion of said shaft engages said semi-hexagonal rigid wall part and said resilient finger extends towards but terminates short of said semi-hexagonal rigid wall part and constitutes a flexible part of said walled socket.

4,295,247

GRIPPER-SEPARATOR DEVICE FOR CONTINUOUSLY SHIRRED CASINGS

Roy L. Trimble, Theodosia, Mo.; Alfred D. Story, and Harold H. Martinek, both of Danville,, Ill., assignors to Teepak, Inc., Chicago, Ill.

Filed May 8, 1980, Ser. No. 147,768
Int. Cl.³ A22C *13/02*
U.S. Cl. 17—1 R **24 Claims**

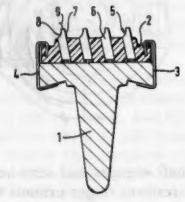


1. In a machine for continuously shirring casings of the type having a fixed mandrel along which the shirred casing is continuously advanced, a segregator for segregating a continuously shirred casing into separate strands, said segregator comprising a gripper unit and a separator unit, means mounting said gripper unit and said separator unit for selected individual movement longitudinally along said mandrel, each of said units including gripper means for engaging an intermediate portion of a shirred casing, control means for separately actuating said gripper means of said units, and drive means for separately moving said units longitudinally along said mandrel with said separator unit being movable away from said gripper unit while said gripper means of said units are engaged with an intermediate portion of a shirred casing to separate a leading portion of said shirred casing from the remainder thereof.

4,295,248
CARDING WIRE BRUSH ARRANGEMENT

Wolfgang Beneke, and Paul Teichmann, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Trutzschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jun. 8, 1979, Ser. No. 46,789
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825506
Int. Cl.[3] D01G *15/24*
U.S. Cl. 19—113 10 Claims

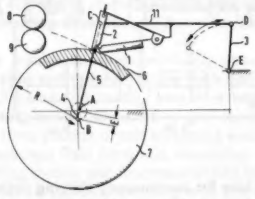


1. A carding wire brush, particularly for revolving flats, comprising: a carrying layer, hooklike brush elements inserted into said carrying layer and protruding from said carrying layer to form carding teeth, said carding teeth having tooth faces forming an angle larger than 90° with said carrying layer, said carding teeth having tooth flanks chamfered and curved concavely in relation to said carrying layer; said carding teeth having tip regions substantially parallel to said carrying layer.

4,295,249
COMBING MACHINE

Bernhard Siemon, Hanover, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Oct. 16, 1979, Ser. No. 85,415
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845245
Int. Cl.[3] D01G *19/16*
U.S. Cl. 19—225 4 Claims

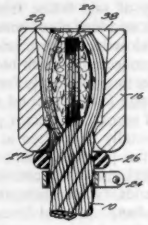


1. A combing machine having stationary detaching rollers (8, 9), a rotating circular comb (6) and reciprocating gripper, said gripper having a lower gripper plate (11) with a gripper opening provided adjacent thereto, said rotating circular comb combing a fiber beard held by said gripper, comprising:
- a driven gripper oscillation shaft (E);
- crank means mounted on said gripper oscillation shaft pivotally connected to said lower gripper plate (11);
- a second driven crank means (4), and
- a guide link (5) pivotally connecting said second driven crank means (4) to said lower gripper plate (11) adjacent said gripper opening whereby effective combing is produced between said gripper and said circular comb.

4,295,250
CABLE DEAD ENDING

James A. Dupuy, 135 McAuley Dr., Vicksburg, Miss. 39180

Filed Sep. 28, 1979, Ser. No. 79,702
Int. Cl.[3] F16G *11/02, 11/04*
U.S. Cl. 24—122.6 5 Claims

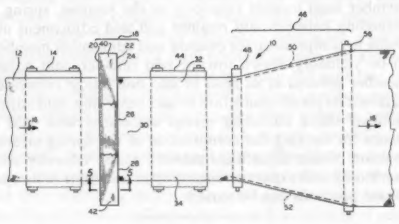


1. A cable dead end of steel multistrand cable including a core strand, comprising:
- a ferrule having an elliptical interior cross section;
- an insert disposed around the cable core strand with the other cable strands disposed around the insert in a birdcage configuration, and with the insert substantially centered in the ferrule interior, said ferrule being generally elliptical in cross section and having barbs on the exterior surface thereof; and
- steel wool packing the ferrule interior between it, the strands, and said insert.

4,295,251
METHOD FOR CONTROLLING EDGE UNIFORMITY IN NONWOVEN FABRICS

Jack R. Tatham, Fair Play, and Jerry L. Shelor, Walhalla, both of S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1980, Ser. No. 130,631
Int. Cl.[3] D04H *1/46*
U.S. Cl. 28—112 12 Claims



1. A method of producing a nonwoven fabric comprising:
- passing a nonwoven fabric web through a needle punching zone, said fabric web being produced from staple fibers and having two edge portions and a medial portion intermediate the edge portions, wherein the weight per unit area of the edge portions is greater than the weight per unit area of the medial portion;
- needle punching the medial portion and the edge portions in the needle punching zone in such a manner that the needle punching density per unit area of said fabric web is less in the two edge portions than the needle punching density per unit area of said fabric web in the medial portion so as to reduce the bonding among the staple fibers of the edge portions relative to the bonding among the staple fibers of the medial portion;
- passing the thus needle punched fabric web to a tentering zone; and

tentering the thus needle punched fabric web so as to stretch said fabric web transversely relative to its direction of movement and thereby reduce the weight of said fabric web per unit area in the edge portions approximately to the weight of said fabric web per unit area in the medial portion so that a nonwoven fabric web of substantially uniform thickness is produced.

8. A method of producing a nonwoven fabric comprising:

moving a nonwoven fabric web along a direction of movement through a needle punching zone, said fabric web comprising nonwoven fibers and having two edge portions and a medial portion intermediate the edge portions, wherein the weight per unit area of the edge portions is greater than the weight per unit area of the medial portion;

needle punching the medial portion and edge portions of said nonwoven fabric web to produce bonding among said nonwoven fibers in the needle punching zone in such a manner that the needle punching density per unit area of said nonwoven fabric web is less in the two edge portions than the needle punching density per unit area of said nonwoven fabric web in the medial portion so as to reduce the bonding among said nonwoven fibers of the edge portions relative to the bonding among said nonwoven fibers of the medial portion;

moving said thus needle punched nonwoven fabric web from said needle punching zone along its direction of movement; and

stretching said thus needled nonwoven fabric web transversely relative to its direction of movement so as to thereby reduce the weight of said nonwoven fabric web per unit area in the edge portions approximately to the weight of said nonwoven fabric web per unit area in the medial portion so that a nonwoven fabric web of substantially uniform weight per unit area is produced.

4,295,252

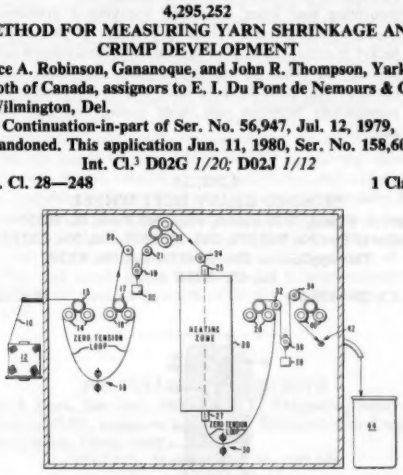
METHOD FOR MEASURING YARN SHRINKAGE AND CRIMP DEVELOPMENT

Bruce A. Robinson, Gananoque, and John R. Thompson, Yarker, both of Canada, assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 56,947, Jul. 12, 1979, abandoned. This application Jun. 11, 1980, Ser. No. 158,609

Int. Cl.³ D02G *1/20*; D02J *1/12*

U.S. Cl. 28—248 **1 Claim**



1. In a method for measuring continuously shrinkage and crimp development in yarns which develop crimp upon heating under low tension and wherein the yarn is advanced by driven rolls from a yarn source to a first tension zone, through a heating zone to a second tension zone and then through an elongation zone, whereby shrinkage and crimp development are determined in a measuring system from ratios of driven roll speeds; the improvement comprising: advancing said yarn downwardly in a free-hanging loop as it passes from said source to said first tension zone while maintaining zero tension in the yarn of said loop by noncontacting means sensing the length of the free-hanging loop and in turn controlling the speed of the driven rolls near the yarn source whereby tension differences in the yarn due to removing the yarn from the source are isolated from the measuring system, passing the yarn downward through said heating zone into a second free-hanging loop while maintaining zero tension in the yarn in said second loop by a second noncontacting means sensing the length of the second free-hanging loop and in turn controlling the speed of driven rolls in the second tension zone whereby the yarn is able to retract completely prior to entering the elongation zone, and cooling the yarn while passing upward to the second tension zone.

4,295,253

PROCESS AND APPARATUS FOR TEXTURIZING FILAMENT BUNDLES

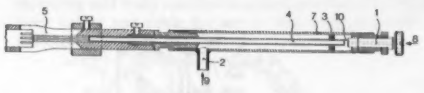
Hans Knopp, Ludwigshafen; Dieter Herion, Frankenthal; Gerhard Conzelmann, Otterstadt, and Heinz Gehrig, Kaiserslautern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,327

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844391

Int. Cl.³ D02G *1/12, 1/16*

U.S. Cl. 28—255 **7 Claims**



1. A process for texturizing bundles of filaments of synthetic high molecular weight materials, comprising

passing the filament bundle through a feed nozzle and then a filament guide tube which is coaxial to said nozzle and is spaced therefrom by a gap,

passing a hot fluid medium from a fluid medum inlet through a space surrounding said filament guide tube, in the direction opposite to the passage of the filaments through said guide tube, toward said gap so as to heat said filaments countercurrent-wise,

imparting to said fluid medium incident to its passage through said space at a location in the immediate vicinity of said gap and over a lengthwise extent short compared with the overall length of said space between the fluid medium inlet and said gap, a vortical motion at a vortex angle of 10° to 70°, said space having an unobstructed cross section between said fluid medium inlet and said vortex imparting location so that the countercurrent-wise fluid flow completely surrounds said tube in transit to said location,

causing the direction of flow of said medium to be reversed at said gap so as to entrain said filaments in their passage through said guide tube, and

feeding the filaments subsequent to their passage through said guide tube, to an expansion stage to produce the crimp.

5. An apparatus for texturizing bundles of filaments of synthetic high molecular weight materials, comprising:

a jacket and, in this order,

a feed nozzle for the filament bundle,

a filament guide tube and

an expansion stage,

said feed nozzle and said filament guide tube being disposed, axially spaced from each other by a gap, coaxially within said jacket,

an inlet for a hot fluid medium provided in said jacket downstream from said gap as viewed in the direction of travel of said filaments through said guide tube, for causing said fluid to flow in the space between said jacket and said guide tube, towards said gap to meet said filaments,

said space being closed past said gap so that said fluid medium reverses its direction of flow at said gap, thereby to entrain said filaments in their travel through said guide tube, and

means provided in said space at a point between said fluid medium inlet and said gap and inclined relatively to the axis of said space, for imparting a vortical motion to said fluid medium at a vortex angle of from 10° to 70°,

said vortex imparting means being located in the immediate vicinity of said gap and having a length short compared with the overall length of said space between the fluid medium inlet and said gap, and

said space having an unobstructed cross section between said fluid medium inlet and said vortex imparting means so that the countercurrent-wise fluid flow completely surrounds said guide tube in transit to said vortex imparting means.

4,295,254

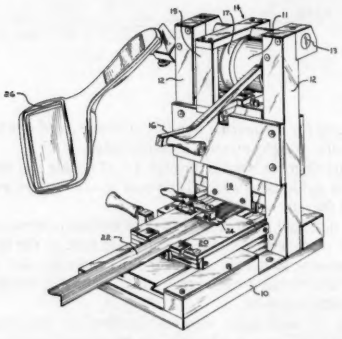
TRANSMISSION LINE CABLE APPLICATOR MACHINE

John E. Adams, Mechanicsburg; Robert F. Evans, New Cumberland, and John H. Gavin, Lancaster, all of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 8, 1978, Ser. No. 940,620

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—33 M **3 Claims**



1. In a machine for terminating to a connector a stripped multi-conductor flat transmission line cable having signal and ground wires, said machine having a base for supporting said connector, a slide movably attached to said base and punch guides supported by said base, the improvement comprising a punch assembly including a signal wire stuffer and buss bar hold down, said punch assembly movable on said punch guides, means for moving said punch assembly toward and away from said connector, said slide having a wire locator for separating exposed signal and ground wires, said punch assembly having plural relatively movable plates for terminating the signal and ground wires respectively in successive strokes toward said connector.

4,295,255

EXPANDED COOLING JACKET ASSEMBLY

Charles M. Weber, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 7, 1979, Ser. No. 36,720

Int. Cl.³ B23P *15/26;* B21D *26/02;* B23K *15/00*

U.S. Cl. 29—157.3 V **4 Claims**

1. A method of manufacturing a cooling jacket comprising the steps of:

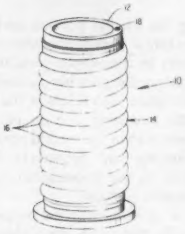
providing a cylindrical inner casing having a fluid inlet and a fluid outlet formed at opposite ends therein extending through a cylindrical portion of said inner casing a;

force-fitting a cylindrical outer sleeve over said cylindrical inner casing to longitudinally align said outer sleeve over said inner casing to cover said inlet and outlet holes extending through said cylindrical portion of said inner casing;

rotating the assembly formed by fitting said outer sleeve over said inner casing at a predetermined rotational speed;

providing an electron-beam welder having a movable welding head;

maintaining the welding head of the electron-beam welder stationary at one end of said outer sleeve to form a sealing weld at the end thereof longitudinally beyond the first hole of said fluid inlet extending through said cylindrical portion of said inner casing;



traversing the welding head of the electron-beam welder along the length of said outer sleeve to form a series of parallel weld lines on said outer sleeve;

maintaining the weld head of the electron-beam welder stationary at the other end of said outer sleeve to thereby form a sealing weld thereat longitudinally beyond the second hole of said fluid outlet extending through said cylindrical portion of said inner casing; and

pressurizing said inner casing by applying a pressure in excess of the normal operating pressure of said cooling jacket to either the inlet or the outlet formed therein while sealing the other to thereby expand said outer sleeve between said parallel weld lines to thereby form a fluid passageway between said inner casing and said outer sleeve.

4,295,256

MOLDED HEAVY DUTY WHEEL

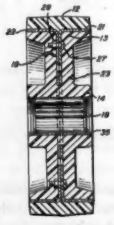
Robert A. Pascal, 1350 Forest, Highland Park, Ill. 60035

Division of Ser. No. 845,074, Oct. 25, 1977, Pat. No. 4,217,944.

This application Oct. 5, 1979, Ser. No. 82,232

Int. Cl.³ B21K *1/32*

U.S. Cl. 29—159.01 **10 Claims**



1. The method of forming a wheel comprising the steps of:

forming a metallic core having a central open portion and a circumferential flange,

positioning and securing said metallic core inside an injection mold,

injecting a moldable material to cover essentially the entire inner portion of said metallic core and interior to said

circumferential flange while forming an aperture at the center portion,

removing the same from the mold,

coating the exterior of said circumferential flange with a bonding agent,

and applying a tread to said bonding agent on said exterior of said circumferential flange, whereby a substantially totally molded wheel is formed utilizing an interfacial metallic member for purposes of bonding two plastic or rubber materials or combination thereof which otherwise will not bond to each other.

4,295,257

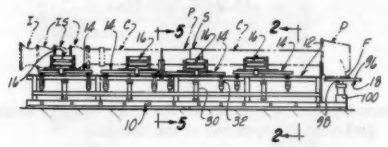
WORK STAND FOR VERTICAL TURBINE PUMPS

Robert F. Strohs, 8736 Buffalo Dr., Union Lake, Mich. 48085

Filed Feb. 20, 1980, Ser. No. 122,990

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—240 **8 Claims**



1. A workstand for supporting and aligning components of a vertical turbine pump during assembly or disassembly comprising an elongate horizontally extending bed frame, a plurality of support cradles mounted at longitudinally spaced positions on said bed frame, each of said cradles comprising a cradle frame and at least a pair of support rollers mounted for free rotation on said cradle frame about spaced parallel horizontal axes extending longitudinally of said bed frame and symetrically disposed on opposite sides of a common vertical plane extending longitudnally of said bed frame, said rollers being operable to supportingly engage cylindrical positions of components of a vertical turbine pump to maintain said components in alignment with each other with the axis of said components lying in said vertical plane, means for independently vertically positioning each of said cradle frames relative to said bed frame, means for independently longitudinally positioning each of said cradle frames relative to said bed frame, and a shaft support assembly for supporting a shaft projecting coaxially from a pump component supported on at least one of said cradles, said shaft support assembly comprising lower frame means adapted to be seated upon the support rollers of one of said cradles, and upper frame means having a longitudinally extending shaft receiving notch of V shaped transverse cross section.

4,295,258

PIN PULLER AND INSERTER

Eric J. Penn, San Jose, and Derylle L. Teegarden, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 21, 1980, Ser. No. 123,195

Int. Cl.³ B25B *27/00*

U.S. Cl. 29—283 **5 Claims**

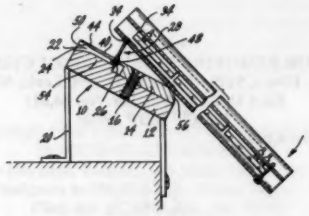
1. A pin puller and inserter for pulling pins from an integrated circuit package shipping rail and inserting pins thereinto, comprising:

a elongated body member having a top and a bottom;

an elongated channel formed in said body member said channel having an outwardly flared opening at one end of said body member and being dimensioned to admit the head of a pin from an integrated circuit package shipping rail through said opening;

a tapered ramp in said channel which progressively narrows the depth of the channel from a dimension which is larger than the depth of the head of a pin to a dimension that will snugly hold the pinhead in place;

a slot in said body member extending from said channel opening along said channel and communicating into said channel, said slot being dimensioned to admit the shank of said pin when the head thereof is admitted into said channel;



a rounded fulcrum surface on said body member on the end thereof opposing said channel opening, said rounded surface serving as a fulcrum for engagement by a package, for pulling a pin whose head is in said channel; and

mounting means on the bottom of said body member for mounting said body member in a fixed position at a convenient height and angle for use in removing pins from a package.

4,295,259

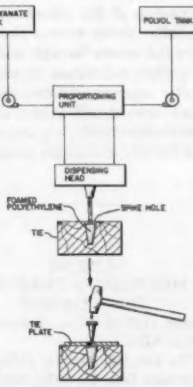
METHOD OF FILLING SPIKE HOLES IN RAILWAY TIES

Curtis A. Rhodes; Tim A. Jur, and Donald A. Keating, all of Columbia, S.C., assignors to Canron Corp., Columbia, S.C.

Filed Oct. 13, 1978, Ser. No. 951,132

Int. Cl.³ B23P *7/00*

U.S. Cl. 29—402.18 **8 Claims**



1. An in situ method of plugging spike holes in a succession of wooden railroad ties and then securing a rail to the ties, comprising: mixing components of a polyurethane foam which is foamable and curable at an outdoor ambient temperature and ambient pressure and which when foamed and cured has a sufficiently high rigidity and density to retain a spike when subsequently driven into foamed polyurethane and the polyurethane is cured, and then immediately injecting the mixed components into the spike holes to a depth sufficient for causing the polyurethane when it is foamed to at least partially fill the holes; causing the holes and the ties to remain at ambient conditions of outdoor temperature and pressure while the foaming and curing of the polyurethane is completed; and

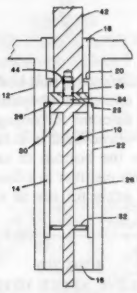
before the polyurethane has cured, placing rail-holding tie plates on the ties over the thus filled spike holes and driving spikes through the tie plates and into thus plugged holes aligned therewith before the polyurethane has cured, for securing a rail to the ties.

4,295,260

TOOL FOR REMOVING SLEEVES FROM CYLINDERS

Robert M. Divers, 9119 Clydesdale Dr., St. Louis, Mo. 63126

Filed Oct. 15, 1979, Ser. No. 84,617
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—426.5 **13 Claims**



7. A method for removing a sleeve from a cylinder having a restricted opening at one end and an unrestricted opening at the other end which comprises inserting a tool provided with guide means into said sleeve from said unrestricted opening of the cylinder, inserting a plurality of radial collar segments from said restricted opening of the cylinder and forming a disc-shaped circular collar fitting over a shoulder of the sleeve, inserting a pusher rod means through said restricted opening, connecting the pusher rod means to said guide means and clamping the collar segments thereto, forcefully moving the pusher rod means toward said unrestricted opening of the cylinder with the clamped collar segments bearing against the sleeve to force it out of the cylinder housing.

4,295,261

METHOD OF MOUNTING A THERMAL INSULATING DOOR GASKET

Richard M. Scherer, Oxford, Miss., assignor to Chambers Corporation, Oxford, Miss.

Division of Ser. No. 869,765, Jan. 16, 1978, Pat. No. 4,214,571. This application Dec. 26, 1979, Ser. No. 107,090
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—451 **1 Claim**

1. A method of mounting a thermal insulating door gasket adjacent an oven liner comprising:

aligning the gasket with a panel opening in an oven panel having an opening perimeter slightly smaller than a perimeter of the gasket;

forcing the gasket into the panel opening to frictionally mount the gasket on the oven panel;

aligning the panel opening with an open end of an oven liner mounted within an oven body;

forcing the panel opening over the liner open end pressing the oven gasket between the liner and the oven panel and exposing a portion of the gasket for engaging an oven door; and

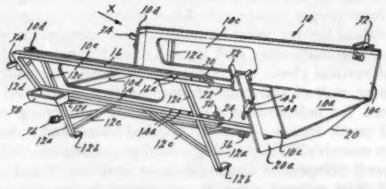
securing the oven panel to the oven body to secure the gasket on the open end of the liner.

4,295,262

METHOD OF MAKING TRUCK BED COVER ASSEMBLY

Daniel Grote, Mt. Clemens; Duane Raymond, Warren, and Joseph C. Mosher, Rochester, all of Mich., assignors to Thermoplastics, Inc., Prairie View, Tex.

Filed Mar. 21, 1980, Ser. No. 132,509
Int. Cl.³ B23P *19/00, 25/00*
U.S. Cl. 29—462 **3 Claims**



1. A method of making a cover for a truck bed, comprising forming a shell having the general configuration of a truck bed cover and having a top wall, and sidewalls joined to the longitudinal margins of the top wall, said shell being of a length which is greater than the length of the cover to be made therefrom; positioning the shell in an inverted condition on a support member having adjustable guide means; positioning the guide means at a predetermined distance inwardly of the leading edge of the shell; trimming the shell along the guide means to provide a body portion for the truck bed cover having the length desired; and completing the assembly of the cover by securing a front panel and rear door thereto while the body portion is maintained in a fixed position on the support member.

4,295,263

CIRCULAR INSULATION SAW SYSTEM

Harry C. Davis, 8993 Airline Hwy., Baton Rouge, La. 70815

Filed Aug. 6, 1979, Ser. No. 63,743
Int. Cl.³ B23D *57/00, 3/02*
U.S. Cl. 29—561 **13 Claims**

1. A circular insulation saw apparatus for cutting blocks of insulation material into pipe insulation members comprising:

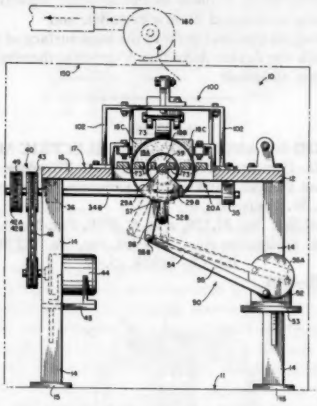
a. a frame with a material feed surface having first and sec-

ond end portions and being supported by the frame, there being further provided a saw mount opening in said feed surface;

b. a powered circular cutting blade movably mounted with respect to said feed surface at the said opening;

c. a shaft spanning said opening and attaching at the end portions thereof to said material feed surface of said frame;

d. at least one strut member attaching said blade to said shaft, said shaft occupying a position at the center of said circular cutting blade;



e. router means on said feed surface between said first end portion and said cutting blade for pre-cutting a generally semi-circular groove in a block of insulation material to be cut responsive to movement of the block of insulation material from said first to said second end portion with the semi-circular groove cut by said router means thereafter registering with said shaft during the subsequent cutting of the insulation block by said blade.

4,295,264

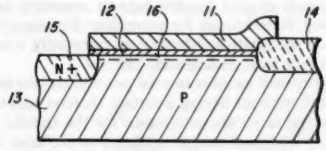
METHOD OF MAKING INTEGRATED CIRCUIT MOS CAPACITOR USING IMPLANTED REGION TO CHANGE THRESHOLD

Gerald D. Rogers, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 645,171, Dec. 29, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,815

Int. Cl.³ H01L *7/44;* **B01J** *17/00*

U.S. Cl. 29—571 **4 Claims**



1. A method of making an MOS integrated circuit device having a capacitor comprising the steps of:

a. providing a body of silicon having an area on a major face thereof for a capacitor device;

b. implanting a shallow surface-adjacent part of said area with conductivity-determining impurity to create a capacitor region in the surface of the silicon to function as the lower plate of the capacitor, the capacitor region being implanted to an impurity concentration selected to exhibit a threshold of the capacitor substantially different from that of the silicon not implanted whereby such region has a threshold less than zero volts;

c. providing a coating of silicon oxide on said area as the capacitor dielectric;

d. applying a layer of polycrystalline silicon over said coating of silicon oxide to provide the upper plate of the capacitor;

e. and diffusing impurity material into the major face near and on one side of said area to a depth much greater than that of said shallow surface-adjacent implanted part to provide electrical connections to the capacitor region, using said coating of silicon oxide as a mask.

4,295,265

METHOD FOR PRODUCING A NONVOLATILE SEMICONDUCTOR MEMORY

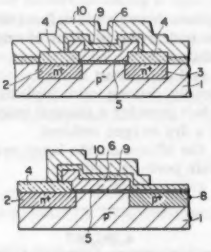
Masatada Horiuchi, Koganei, and Hisao Katto, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,501

Claims priority, application Japan, Jul. 31, 1978, 53-92634

Int. Cl.³ H01L *21/28*

U.S. Cl. 29—571 **11 Claims**



1. Method for producing a nonvolatile semiconductor memory comprising;

a step of forming a source region and a drain region in a surface portion of a semiconductor substrate having a first conductivity type, said source region and said drain region having a second conductivity type which is opposite to said first conductivity type;

a step of forming a thin insulating film on a channel region between said source region and said drain region;

a step of depositing a silicon layer on at least a portion of said thin insulating film;

a step of doping said silicon layer and at the same time at least one surface portion of said substrate, which is adjacent to said channel region, with impurity having the same conductivity type as that of said substrate for forming a floating gate and at least one high impurity concentration region, doping of said at least one high impurity concentration region being effected by self-alignment with said floating gate using said floating gate as part of a mask;

a step of forming a second insulating film on the surface of said floating gate; and

a step of forming a control gate electrode on said second insulating film.

4,295,266

METHOD OF MANUFACTURING BULK CMOS INTEGRATED CIRCUITS

Sheng T. Hsu, West Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

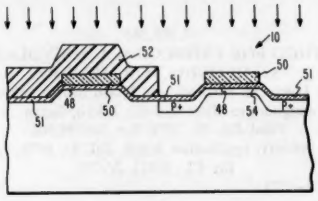
Filed Jun. 30, 1980, Ser. No. 164,681

Int. Cl.³ H01L *21/26*

U.S. Cl. 29—571 **7 Claims**

1. An improved method for manufacturing a complementary symmetry metal oxide semiconductor integrated circuit comprising the steps of:

(a) forming an oxide layer on the surface of a semiconductor substrate of a first conductivity type;
(b) forming a silicon nitride layer on the surface of said oxide layer;
(c) defining said silicon nitride layer to cover areas where transistors will be formed in said substrate; and
(d) applying a photoresist layer over said defined silicon nitride layer; wherein the improvement comprises the steps of:
(a) defining openings in said photoresist layer over areas where well regions of opposite conductivity type to said substrate will be formed;



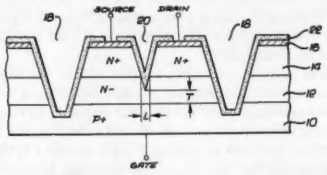
(b) implanting ions through said defined silicon nitride layer, through the underlying portions of said oxide layer and into said substrate;
(c) removing said photoresist layer;
(d) simultaneously driving said implanted ions into said substrate while growing a thermal oxide by heating said substrate in a dry oxygen ambient;
(e) removing the silicon nitride layer and any underlying silicon dioxide portions; and
(f) growing a gate oxide layer.

4,295,267

TWO-MASK VJ-FET TRANSISTOR STRUCTURE

Alan L. Harrington, Glendale; Vladimir Rodov, Hollywood, and Richard Allison, Los Angeles, all of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed Jul. 18, 1980, Ser. No. 170,144
Int. Cl.³ H01L *21/20*
U.S. Cl. 29—571 **5 Claims**



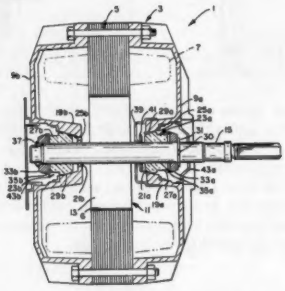
1. A method of making field effect transistor devices comprising:
(a) forming a wafer consisting of an epitaxial layer of semiconductor material of a first conductivity type on a substrate of semiconductor material of a second conductivity type;
(b) forming an ohmic layer of semiconductor material of a third conductivity type in the epitaxial layer;
(c) forming an ohmic refractory metal layer on the surface of the ohmic layer;
(d) creating a central and two outer openings in the metal layer, wherein the outer openings are wider than the central opening;
(e) forming, through the central opening, a device definition V-groove by anistropically etching the semiconductor wafer, said device definition V-groove extending through the ohmic layer, dividing it into separate regions, and into the epitaxial layer, thereby defining a conduction channel between the separate regions around the device definition V-groove;
(f) forming, through the outer openings, isolation V-grooves by anistropically etching the semiconductor wafer, said isolation V-grooves extending through the ohmic layer and the epitaxial layer into the substrate, thereby defining the outer edges of the separate regions;
(g) forming a passivating layer on the front surface of the wafer;
(h) creating openings in the passivating layer over the separate regions;
(i) forming metal contacts to the separate regions, thereby defining source and drain electrodes; and
(j) forming an ohmic contact to the back surface of the wafer beneath the device definition V-groove, thereby defining the gate electrode.

4,295,268

METHOD OF ASSEMBLING AN ELECTRIC MOTOR

William D. Punshon, Bridgeton, and C. Theodore Peachee, Maryland Heights, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 27,728, Apr. 6, 1979, Pat. No. 4,245,870.
This application Aug. 28, 1980, Ser. No. 182,084
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—596 **1 Claim**



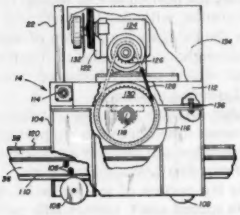
1. The method of assembling an electric motor having a stator assembly including a core having a bore therethrough, a rotor, a shaft extending axially from said rotor in opposite directions, and a pair of bearing support members secured to said core for journalling said shaft for rotation about its axis with the rotor being rotatable within said bore, said method comprising the steps of:
inserting said rotor in said bore with said shaft extending outwardly therefrom;
installing a pair of said bearing support members on said core, each of said bearing support members having an opening therethrough for reception of a respective portion of said shaft and having an outwardly opening tapered race surrounding said shaft;
fixing a first ball member in axial position on said shaft, said first ball member having a surface thereon adapted to be journalled in its respective race for the transfer of both radially loads and axial thrust loads in one axial direction from said shaft to said stator assembly;
installing a second ball member on said shaft, said second ball member having a surface thereon adapted to be journalled in its respective race for the transfer of both radial loads and axial thrust loads in the opposite direction from said first ball member;
seating said first ball member in its race;
seating said second ball member in its race; and
axially securing said second ball member relative to said shaft thereby to substantially prevent axial movement of said shaft and said rotor relative to said stator assembly.

4,295,269

TRUSS ASSEMBLY APPARATUS

Ronald F. Wright, 6901 Glen Hills Rd., Fort Worth, Tex. 76118

Filed May 31, 1979, Ser. No. 44,060
Int. Cl.³ B23P 19/00
U.S. Cl. 29—798 12 Claims



1. Apparatus for assembling trusses from precut truss members and fastener plates, said apparatus comprising:

an elongate table having a work surface thereon;

a rigid support means supporting the table from a support surface such as the floor with the work surface in an elevated position above the support surface;

a pair of elongate side members secured to said table, said side members positioned to protrude above the work surface on the table and to extend in a spaced apart relationship, each side member having a support surface thereon which is positioned above the work surface, said side members and work surface defining a recess of sufficient size to receive therein said precut truss members and fastener plates for assembly into trusses by said apparatus;

carriage means supported above the work surface of said table and mounted for movement therealong;

press roller means mounted for pressing said fasterner plates into said truss members and for rolling movement along said side members, said press roller means spanning the recess between said side members and engaging said support surface on each of said side members, said roller means being supported in a position spaced above said work surface,

means rotatably connecting said press roller means to said carriage for effecting both carriage movement and said rolling movement of said press roller means along the support surfaces on said side members for contacting and pressing said fastener plates into truss members located in said recess; and

means for selectively effecting movement of said carriage and press roller means along said table.

4,295,270

ELECTRODE POSITIONING SYSTEM

Jacob J. Cammarata, Crystal, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 15, 1979, Ser. No. 84,802
Int. Cl.³ H01B 13/20
U.S. Cl. 29—828 6 Claims

1. A method of positioning a ring electrode at a desired location on, and in electrical communication with, the outer braided conductor of a coaxial electrical lead comprising the steps of:

stripping the outer insulation from the desired electrode location to one end of said lead to expose said braided conductor;

pushing the exposed braided conductor back from said one lead to expose said one lead end;

severing at least a portion of said exposed lead end;

extending said braided conductor past said exposed lead end;

forming the extending braided conductor into a twist; and

threading said twist and exposed braided conductor through a ring electrode having an inside diameter generally identical to the outside diameter of said braided conductor until said ring electrode overlies said desired location.

4,295,271

METHOD OF SOLDERING A LEAD TO A SINTERED LEAD PAD

Donald Neuhoff; Arthur H. Mones, and Man K. Lam, all of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Division of Ser. No. 942,728, Sep. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 861,226, Dec. 16, 1977, abandoned. This application Apr. 3, 1980, Ser. No. 137,043
Int. Cl.³ H05K 3/34
U.S. Cl. 29—840 3 Claims

1. The method of soldering a lead to a lead pad on a substrate comprising the steps of:

printing a conductor pattern including at least one lead pad on the substrate using a gold composition, said gold composition being composed of finely divided gold particles and finely divided inorganic binder particles dispersed in an inert liquid vehicle, by weight 98 to 99 percent gold particles and complementally 2.0 to 1.0 percent inorganic binder particles, the binder consisting essentially by total weight of gold and binder of:

0.6 to 0.2 percent copper

0.2 percent lead

0.2 percent cadmium and the balance glass;

firing the substrate to sinter the inorganic materials of the gold composition;

presoldering the lead pad with a lead indium solder using a noncorrosive solder flux;

presoldering a lead with a lead indium solder using a noncorrosive solder flux; and

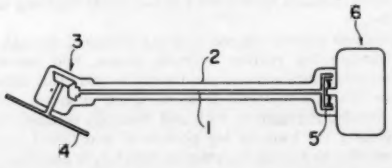
soldering the presoldered lead to the presoldered lead pad using a noncorrosive solder.

4,295,272

VIBRATION CONTROL FOR MOWING MACHINE

Toshifumi Kubota, Katsuta, Japan, assignor to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Apr. 25, 1980, Ser. No. 143,862
Claims priority, application Japan, Apr. 28, 1979, 54-52844
Int. Cl.³ A01D 35/00
U.S. Cl. 30—276 10 Claims



1. A mowing machine having a prime mover, a centrifugal clutch connected to said prime mover at one end thereof, a shaft connected to the other end of said centrifugal clutch at one end thereof, a gear means connected to the other end of said shaft, a rotary blade connected via said gear means to said shaft, and a pipe for covering said shaft, said centrifugal clutch starting transmission of the rotational torque of said prime mover to said shaft when the rotational frequency of said prime mover exceeds a predetermined value, rotary portions of said prime mover, centrifugal clutch, shaft, gear means and

rotary blade constituting a rotational system, wherein the improvement comprises:

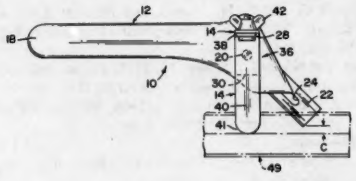
the outer diameter of said shaft is selected such that the torsional natural vibration frequency of said rotational system is below one third of said predetermined value.

4,295,273

COMBINATION CARPET RAZOR KNIFE AND GUIDE

James Matthews, 11373 121st Ter. N., Largo, Fla. 33540

Filed Jan. 17, 1980, Ser. No. 113,070
Int. Cl.³ B26B *29/00*
U.S. Cl. 30—293 **1 Claim**



1. A device for cutting carpets, comprising, in combination,

a blade having a cutting edge and an elongated longitudinally extending central slot formed in said blade, said slot formed in parallelism with said cutting edge,

an elongate handle member,

a blade-retaining member,

said blade-retaining member integrally formed with said elongate handle member,

said elongate handle member and said blade-retaining member disposed in co-planar relation to one another,

said blade-retaining member disposed in angular relation to said elongate handle member,

an internally threaded bore formed in said blade-retaining member,

said bore orthogonally disposed relative to the plane of said elongate handle member and said blade-retaining member,

said blade-retaining member adapted to slidingly receive said blade member so that said blade member is disposed in sandwiched relation to said blade-retaining member and so that the slot formed in said blade member is aligned with said bore throughout a plurality of functional positions of adjustment of said blade member,

a first L-shaped member having a truncate leg portion and an elongate leg portion,

said truncate leg portion having an aperture means formed therein,

said truncate leg portion disposed so that said aperture means formed therein is in aligned relation with said internally threaded bore formed in said blade-retaining member,

a first bolt member aligned with and extending through said truncate leg portion aperture means, said internally threaded bore and said slot formed in said blade member so that said first bolt member, when in secure screw-threaded engagement with said internally threaded bore, secures the truncate leg portion of said first L-shaped member to said blade-retaining member, in abutting relation thereto, and maintain the sandwiched relation between said blade member and said blade-retaining member,

said elongate leg portion disposed at right angles to the plane of said blade-retaining member when said truncate leg portion is secured to said blade-retaining member,

said elongate leg portion being substantially flat and being generally disposed in a horizontal plane,

said elongate leg portion having a longitudinally extending central slot,

a second L-shaped member having a truncate leg portion and an elongate leg portion substantially orthogonally disposed relative to said truncate portion,

an aperture formed substantially centrally of said truncate leg portion,

said truncate leg portion being flat and disposed in abutting relation to the underside of said elongate leg portion of said first L-shaped member so that the aperture formed in said truncate leg portion of said second L-shaped member is in registration with the longitudinally extending slot formed in the elongate leg portion of said first L-shaped member throughout a plurality of functional positions of adjustment of said second L-shaped member relative to said first L-shaped member,

a bolt member aligned with and extending through said aperture means in said truncate leg portion of said second L-shaped member and said slot formed in the elongate leg portion of said first L-shaped member,

said elongate leg portion of said second L-shaped member disposed in spaced apart, substantially parallel relation to the common plane of said handle member and said blade-retaining member when the truncate leg portion of said second L-shaped member is disposed in abutting relation to the elongate leg portion of said first L-shaped member,

said elongate leg portion of said second L-shaped member having a distal end portion that extends beyond the distal end of said blade member so that at least a portion of said distal end of such elongate leg portion slidedly engages a carpet edge when said blade member is disposed in cutting relation to a carpet,

said distal end portion of said elongate leg portion thereby serving as a cam follower means that effectively communicates the contour of a carpet edge to said blade member,

a wing head engaged in screw threaded relation to said second bolt so that the apertured truncate leg portion of said second L-shaped member and the slotted elongate leg portion of said first L-shaped member are releasably secured to one another, said truncate leg portions of said second L-shaped member and hence said elongate leg portion of said second L-shaped member being positionable in a plurality of functional positions of adjustment attendant loosening and tightening of said wing head, so that the spaced apart relation of said elongate leg portion of said second L-shaped member and said blade member is variable,

whereby a substantially perfect seam between two abutting carpets is at least in part provided by loosening said wing head, positioning said blade member and the elongate leg portion of said second L-shaped member in a preselected spaced apart relation such that said elongate leg portion of second L-shaped member is substantially parallel to said blade member, tightening said wing head to fix the spaced apart relation of said blade member and said elongate leg portion of said second L-shaped member, positioning the abutting edges of said abutting carpets so that one edge overlies the other, cutting both of said carpets with a conventional top cutter tool so that the cut made in the backing of the overlying carpet is in substantial vertical alignment with the cut made in the backing of the underlying carpet through the length of said cut, cutting a first salvage edge from the overlying carpet by placing the overturned edge of said carpet in sliding abutting relation to the elongate leg portion of said second L-shaped member and cutting the backing of said carpet with said blade while maintaining the sliding abutting relation of said carpet edge and said elongate leg portion of said second L-shaped member so that the cut so made in said backing is substantially parallel to the cut made in said backing by said top cutter tool, said distal end portion of such elongate leg portion of said second L-shaped member thereby serving as a cam follower means that effectively communicates the contour of a carpet edge to said blade member, and cutting a salvage edge from said underlying carpet in a like manner,

whereby the respective cuts made in the backing of said

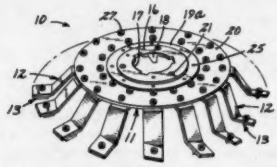
abutting carpets by said blade follow the contour of the respective cuts made in the backings of said carpets by said conventional top cutter means, which cuts made in said overlying and underlying carpets by said conventional top cutter means define a mating profile, so that the backings of the carpets will mate when said carpets are placed in upturned, side-by-side relation to one another, such that a substantially perfect seam is formed between said abutting carpets.

4,295,274

SCARIFYING MACHINE

Charles W. Bricher, St. Paul, and Ferdinand J. Herpers, Minnetonka, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Jul. 27, 1978, Ser. No. 928,685
Int. Cl.³ B26B *27/00, 25/00*
U.S. Cl. 30—347 **23 Claims**



1. A tool suitable for removing built-up layers of soilage or coatings from surfaces, said tool comprising:

first support means adapted for attachment to a rotary power machine;

second support means mounted on said first support means, said second support means comprising a multiplicity of radially-extending elongated resilient spring members; and

removable cutter means mounted on said second support means;

said first support means, second support means and cutter means in combination serving to at least partially support said rotary power machine on said surface, said cutter means being resiliently supported with respect to said first support means by said second support means.

4,295,275

METHOD AND APPARATUS FOR MAKING RAISED AND FLAT LETTER SIGNS

Larry Cugini, Sr., and John J. Cugini, both of 23 Holley St. Extension, Danbury, Conn. 06810

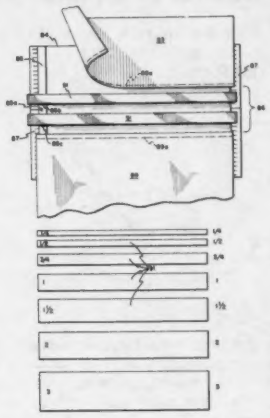
Division of Ser. No. 23,599, Mar. 26, 1979, Pat. No. 4,230,513. This application May 8, 1980, Ser. No. 147,919
Int. Cl.³ B43L *5/00;* **G01B** *3/14;* **G09F** *7/04*
U.S. Cl. 33—1 G **1 Claim**

1. A layout table for making signmakers' line level indicating layout master guide strips comprising a paramagnetic layout panel having height and width at least equal to those of a signblank to be laid out,

a blank layout master strip of sheet material positionable along one side of the layout panel, an upper curtain sheet having a magnetized strip along its lower edge positionable across the upper portion of the layout panel to denote the upper edge of a signblank,

a lower curtain sheet having a magnetized strip along its upper edge positionable across the lower portion of the layout panel to denote the lower edge of a signblank, leaving a central transverse portion of the blank layout master strip and the layout panel exposed between the curtains representing the signblank,

and a selectable plurality of magnetized layout strips of different widths corresponding to heights of letters to be employed by the signmaker, each individually positionable extending across the exposed panel portion and the blank layout master and independently manually adjustable to positions representing individual lines of sign letters



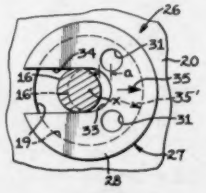
whereby the signmaker may shift and readjust the magnetized layout strips on the paramagnetic panel to produce a visually pleasing line layout, and then inscribe the blank layout master with line level indicia, thereby completing the layout master for juxtaposition with a signblank for indicating the level of lines of letters to be mounted thereon.

4,295,276

TEMPLATE FOR ALIGNING A SHAFT

Rayburn P. Ellington, III, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 3, 1978, Ser. No. 957,507
Int. Cl.³ G01B *7/31*
U.S. Cl. 33—181 R **5 Claims**



1. A shaft alignment template (**26**) comprising:

a disc (**27**) having a diameter larger than the thickness thereof,

a piloting slot means (**32**) formed through said disc (**27**) for engaging a shaft member therein, said piloting slot means (**32**) including a semi-circular opening (**33**) disposed centrally of said disc and a slot portion (**34**) extending radially outwardly from said opening (**33**) in tangential relationship therewith and terminating in open relationship at the periphery of said disc (**27**), and

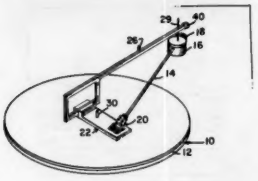
an annular flange (**28**) having an annular hub means (**29**) secured on only one side thereof for engaging another member, said hub means (**29**) having an outside diameter which is less than the outside diameter of said flange (**28**).

4,295,277

STYLUS POSITIONER

Francis G. Dennesen, Beverly; Richard S. Wilson, Swampscott; Roy D. Toulan, Jr., Beverly, and Peter Madnick, Andover, all of Mass., assignors to Dennesen Electronics Inc., Beverly, Mass.

Filed Sep. 26, 1979, Ser. No. 79,041
Int. Cl.³ G11B 3/10
U.S. Cl. 33—181 R **29 Claims**



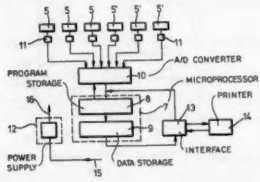
1. A stylus positioner for a turntable assembly, which assembly has a turntable mounted to rotate about a spindle and a stylus arm pivotably mounted proximate said turntable, which stylus arm moves on a pivot axis relative to said turntable, which positioner comprises; a locater plate having an aperture which fits over said spindle and pivots thereon; said plate having a stylus positioning indicator therein at a distance from said spindle; a pivot arm fixably connectable to said locater plate; means for rotating said pivot arm and thus said locater plate around said spindle toward the pivot axis of said stylus arm to locate said indicator on said turntable so that the stylus can be positioned on said stylus arm in registration with said indicator.

4,295,278

METHOD AND APPARATUS FOR MEASURING OUT A STRAND GUIDE ARRANGEMENT

Hans Gloor, Umiken, Switzerland, assignor to Concast AG, Zürich, Switzerland

Filed Jan. 14, 1980, Ser. No. 111,768
Claims priority, application Switzerland, Jan. 30, 1979, 883/79
Int. Cl.³ G01B 5/14
U.S. Cl. 33—182 **4 Claims**



1. An apparatus for measuring out a strand guide arrangement of a continuous casting installation, comprising:

means providing a strand guide arrangement defining guide tracks arranged at a mutual spacing from one another;

a measuring device provided with measuring feeler means capable of moving along the guide tracks of the strand guide arrangement; and

said measuring device comprising:

analogue-digital converter means operatively connected with said measuring feeler means;

microprocessor means containing program means and data storage means connected with said analogue-digital converter means, said storage means being displaced with the measuring means through the guide arrangements; and

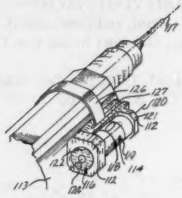
interface means operatively connected with said microprocessor means.

4,295,279

HAND TOOL LEVELING APPARATUS

Walter F. Sienknecht, 3839 Temple City Blvd., Rosemead, Calif. 91770

Filed Mar. 10, 1980, Ser. No. 128,723
Int. Cl.³ G01C 9/28
U.S. Cl. 33—334 **9 Claims**



1. Apparatus for leveling a tool having a working axis comprising:

a receptacle of a predetermined configuration attached to the tool;

an elongated, sealed, transparent cylindrical tube containing a liquid and a bubble formed by the liquid, said tube being mounted in the receptacle with its horizontal axis parallel to the working axis of the tool to level the tool in a horizontal plane, the receptacle being configured so as to enable viewing the bubble in the cylindrical level from at least the top and both sides thereof.

a circular bubble level mounted in the receptacle having an axis passing perpendicular through the center of the circular level, said axis being disposed parallel to the working axis of the tool for leveling the tool in a vertical plane, said circular level containing a transparent liquid and a bubble formed by the liquid, said circular level being biconvex in cross-section and positioned in the receptacle whereby the bubble can be properly positioned in the level to level the tool in either the vertical upward or vertical downward positions and the circular level retains the cylindrical level in the receptacle; and

resilient means for removably locking the circular bubble level within the receptacle.

4,295,280

METHOD OF OBTAINING A LYOPHILIZED PRODUCT

John Krupey, Montreal, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,927
Int. Cl.³ F26B 5/06
U.S. Cl. 34—5 **6 Claims**

1. A process for obtaining a package containing a mass of dry material comprising at least two immunologic reagent materials incompatible with each other in the presence of moisture comprising the steps of:

(a) preparing separate aqueous liquid compositions of each of the materials;

(b) cooling each of the liquid compositions to a temperature slightly above its freezing point;

(c) mixing the cooled liquid compositions to obtain a mixture thereof;

(d) charging the mixture of liquid compositions at a temperature slightly above the freezing point of the mixture into a container maintained at a temperature substantially below the freezing point of the mixture so that the mixture freezes in the container; and

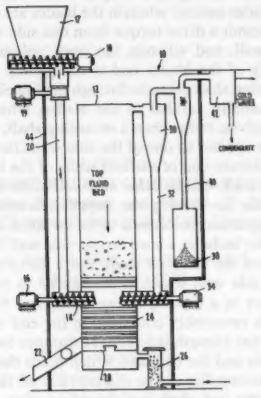
(e) lyophilizing the frozen mixture.

4,295,281

DRYING SOLID MATERIALS

Owen E. Potter, Camberwell, Australia, assignor to Monash University, Victoria, Australia

Filed Dec. 29, 1978, Ser. No. 974,245
Claims priority, application Australia, Feb. 10, 1978, PD3341
Int. Cl.[3] F26B *3/08, 3/10, 3/00, 5/00*
U.S. Cl. 34—10 13 Claims



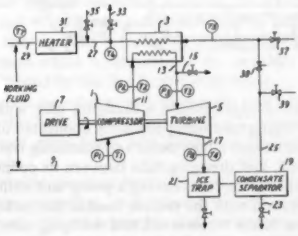
3. In a method of drying a solid material containing less than 95% by weight of a vapourisable material which comprises establishing a fluidized bed containing the solid material, introducing fluidizing medium, heating the fluidized bed indirectly, feeding the material to be dried to the fluidized bed, removing dried solid material therefrom, and removing vapour product from the fluidized bed; the improvement wherein the fluidizing medium is the vapourizable material in vapour form, wherein dried solid material is removed from the bottom of the fluidized bed, and wherein vapour product comprising the vapourisable material substantially uncontaminated by other gases is removed from the fluidized bed for further use.

4,295,282

HEAT AND LIQUID RECOVERY USING OPEN CYCLE HEAT PUMP SYSTEM

Bryce J. Fox, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1978, Ser. No. 960,774
Int. Cl.[3] F26B *21/08*
U.S. Cl. 34—27 29 Claims



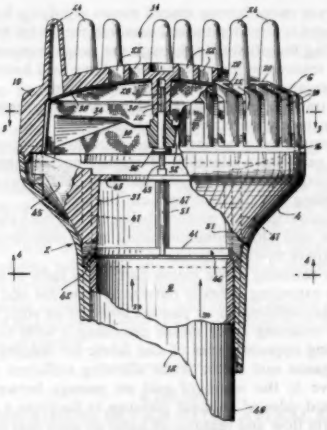
1. A drying oven system for removing vaporizable liquid from materials laden with said liquid, said system comprising a circulating gas drying oven having in combination therewith liquid removal apparatus for removing condensable vapor from said circulating gas, said apparatus comprising, in sequence means for compressing said gas, means for cooling said compressed gas and means for expanding said compressed gas to effect further cooling of said gas, said cooling causing condensation of at least a portion of the vapor contained therein, said apparatus further including means for separating the condensed liquid from said circulating gas.

4,295,283

AIR DIFFUSER FOR A HAIR DRYER

Patrick M. Tomaro, deceased, late of Maplewood, N.J. (by Rita Tomaro, executrix), assignor to Conair Corporation, Edison, N.J.

Continuation of Ser. No. 40,886, May 21, 1979, abandoned. This application Jun. 19, 1980, Ser. No. 161,073
Int. Cl.[3] A45D *20/12*
U.S. Cl. 34—97 5 Claims



1. A diffuser attachment for a hand-held hair dryer for dissipating and reducing the force of an air stream of a hair dryer, said diffuser including:

a housing having an air inlet opening at a first end and an air outlet opening at a second end in alignment with said air inlet opening such that air introduced into said air inlet opening flows through said housing and is discharged therefrom through said air outlet opening,

said air outlet opening being larger than said air inlet opening,

said first end of said housing being adapted to be removably interconnectable with an air discharge outlet of a hair dryer,

a freely rotatable fan rotatably mounted within said housing between said air inlet opening and said air outlet opening having a plurality of fan blades arranged symmetrically about a central hub,

said fan blades extending substantially throughout the entire cross sectional area of said housing,

said blades of said fan being so positioned such that substantially all the air discharged from said hair dryer into said air inlet opening strikes said fan and causes it to rotate,

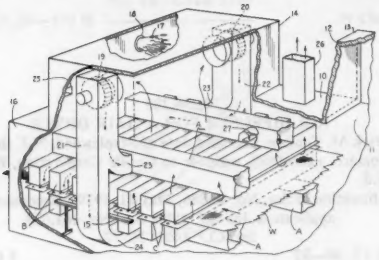
whereby said rotatable fan disperses and deflects substantially all air discharged from said hair dryer into a plurality of diversely directed, less powerful eddy air currents, which are discharged from said housing through said air outlet opening.

4,295,284

DRYER RANGE

Philip M. Witkin, Greenville, S.C., assignor to Marshall and Williams Company, Greenville, S.C.

Filed Jul. 5, 1979, Ser. No. 54,861
Int. Cl.³ F26B *13/02*; D06C *3/02*
U.S. Cl. 34—155 **2 Claims**



1. A dryer range having spaced means supplying heated air to upper and lower longitudinal manifold means for treating a web moving longitudinally through the range comprising:

spaced transverse plenums carried above said lower manifold means receiving heated air therefrom;

spaced transverse plenum carried below said upper manifold means receiving heated air therefrom;

said plenums each having a closure member opposite said web carrying a plurality of spaced nozzles therealong directing heated air against said web, and opposed sides extending marginally of said closure member;

said spaced transverse plenums being carried both above and below said cloth communicating with respective upper and lower manifold means;

air flow retaining baffle means carried by each of said plenums extending laterally outwardly adjacent said closure member defining an air passage adjacent an edge thereof;

said air retaining baffle means providing a wide face confronting opposing sides of said fabric for holding heated air against said fabric while allowing sufficient spacing relative to the width of said air passage between said opposed sides of adjacent plenums to facilitate a smooth uniform flow and removal of spent air such that moisture is evenly removed from said web, and

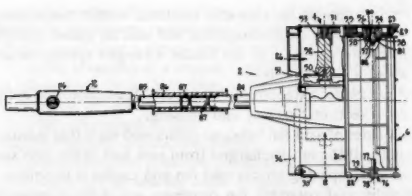
the area of entrance of said air passage being greater than the area of said nozzles.

4,295,285

SNOWTHROWER

Eric Stevens, El Cajon, Calif., assignor to The Toro Company, Minneapolis, Minn.

Filed Dec. 17, 1979, Ser. No. 104,264
Int. Cl.³ E01H *5/00*
U.S. Cl. 37—43 D **8 Claims**



1. An improved snowthrower of the type having a snow throwing impeller mounted in an impeller housing, wherein the impeller housing has end walls and an outlet through which the snow is thrown by the impeller, wherein the impeller is mounted between the end walls of the impeller housing for rotation about a substantially horizontal axis, wherein the impeller includes a plurality of impeller blades which are spaced apart from one another to establish an open volume therebetween, and wherein the improvement relates to the impeller and comprises:

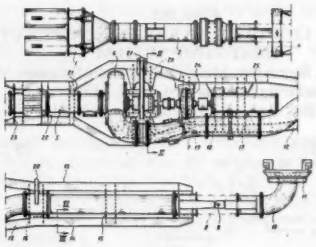
an impeller having spaced apart side walls between which the blades extend, wherein the blades are sufficiently rigid to transmit a drive torque from one side wall to the other side wall, and wherein the open volume is radially inwardly of the blades and is completely open in that no mounting shaft extends through the impeller in a direction substantially parallel to the blades, whereby the blades themselves, rather than a mounting shaft, transmit a drive torque applied to one of the side walls through the impeller, wherein one of the end walls of the housing includes a stub shaft and the other end wall of the housing includes a means for driving the impeller, wherein the impeller driving means includes a drive member, and wherein the impeller includes a bore on one side wall for being loosely received on the stub shaft and a drive aperture on the other side wall which is configured to receive the drive member in a driving engagement, and wherein the stub shaft is removably contained in the end wall and the impeller has a length less than the distance between the drive member and the end wall which holds the stub shaft such that the impeller can be slid laterally off the drive member when the stub shaft is removed to allow removal of the impeller without disassembly of the impeller or the end walls of the housing.

4,295,286

SUPPORT FRAME FOR MOTOR, PUMP AND SUCTION TUBE OF A SUCTION DREDGER

Willem Brandwijk, Nieuw-Lekkerland, and Herman Dam, Alblasserdam, both of Netherlands, assignors to IHC Holland N.V., Papendrecht, Netherlands

Filed Apr. 8, 1980, Ser. No. 138,402
Int. Cl.³ E02F *3/88*
U.S. Cl. 37—58 **9 Claims**



1. A suction dredger having a dredging tube with suction head, said dredging tube being pivotably connected to the side wall of the hull about a horizontal axis extending transversely to the side wall, said dredging tube between its connection to the hull and its suction head having a pump unit with a motor which in operation with the suction head at the bottom of the water operates below water level, said dredging tube between the pump and its connection to the hull having a pivot frame with one pivot axis in a vertical plane, through which frame extends a hose interconnecting the pressure conduit parts of the dredging tube while between said pump and its suction head a cardan joint frame has been provided through which extends a further hose interconnecting the suction tube parts of the dredging conduit, said cardan joint frame and said vertical pivot frame forming integral parts of a support frame, carrying

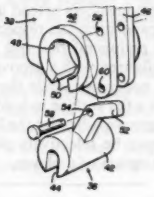
the motor and the pump as well as the adjacent part of the suction tube and the part of the pressure conduit tube between cardan joint and vertical pivot frame respectively, said support frame at the side turned towards the hull having one or more fenders extending outside the longitudinal profile of the support frame and the motor and the pump and the tube parts supported by it.

4,295,287

BACKHOE BUCKET QUICK COUPLER

Ronald C. Natzke, Burlington, and Thomas R. Brown, Yarmouth, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Apr. 10, 1980, Ser. No. 139,037
Int. Cl.³ E02F *3/70*
U.S. Cl. 37—103 **2 Claims**



1. A quick attachment and release mechanism for attaching a bucket to a loader scoop arm, said mechanism comprising:

a quick coupler pivotally mounted to an end of said scoop arm for receiving various types and sizes of buckets, said quick coupler having a three-leg configuration including a pair of bucket mounting legs pivotally mounted to opposite sides of said scoop arm end, each bucket mounting leg including a hook portion engaging a lateral projection of a mounting pin on said bucket;

a releasable latch mechanism rotatably mounted on a third leg of said quick coupler for engagement with a latch pin mounted on said bucket, said latch mechanism including a main body having a slot along its longitudinal extent, said main body rotatably mounted between spaced apart side members which form said third leg of said quick coupler;

each side member including a bearing for rotatably holding one end of said main body, each bearing including a slot, said bearing slots forming an opening through said side members which is substantially the same size as the opening formed by the slot in said main body;

a latch arm mounted to said main body, said latch arm being movable in the space between said side members for rotating said main body, said latch arm having an opening therein;

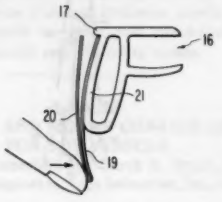
and said side members having spaced apart first and second latching openings, said opening in said latch arm being aligned with and secured to said first opening through said side members by pin means thereby axially aligning said slot in said main body with said bearing slots so that said main body slot may be seated on said bucket latch pin, and said opening in said latch arm being aligned with and secured to said second opening through said side members by said pin means thereby providing a mounting for said bucket latch pin in said main body for coupling said bucket to said quick coupler.

4,295,288

HOLDER FOR INFORMATION CARRIERS IN STRIP FORM

Ake G. Westberg, Sundsvall, Sweden, assignor to H. L. Plast H. Lundvall AB, Sundsvall, Sweden

Continuation-in-part of Ser. No. 841,764, Oct. 13, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 962,849
Claims priority, application Sweden, Oct. 15, 1976, 7611481
Int. Cl.³ G09F *3/18*
U.S. Cl. 40—16.4 **10 Claims**



1. A holder for information strips, such as price strips for supermarket shelves, goods containers and the like, comprising:

(a) an attachment portion for removably mounting the holder to a shelf, container edge or the like,

(b) a display portion for receiving an information strip, said display portion defining a pocket having an upwardly directed opening and a portion extending below said attachment portion, said pocket having a prestressed transparent front wall forming a front-facing surface of said holder, said display portion flexible to deflect said front wall under a force applied to said pocket portion extending below said attachment portion thereby opening said upwardly directed opening and

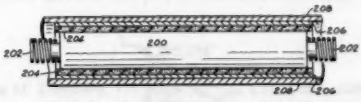
(c) means connecting a rear wall of said display portion to said attachment portion at a point spaced from the bottom of said pocket.

4,295,289

LASER AIMING DEVICE WITH LATERAL SHOCK ABSORBER

Wesley L. Snyder, 1103 Forest Home Dr., Houston, Tex. 77077

Continuation-in-part of Ser. No. 949,997, Oct. 10, 1978, Pat. No. 4,168,588, which is a continuation-in-part of Ser. No. 846,691, Oct. 31, 1977, Pat. No. 4,161,076. This application Feb. 12, 1979, Ser. No. 11,085
Int. Cl.³ F41G *1/34*
U.S. Cl. 42—1 A **18 Claims**



1. An aiming device for attachment to a barrelled weapon comprising:

a light source for projecting a coherent beam of light onto a target;

a member securable to the weapon for carrying said light source such that the beam is directed along the barrel of the weapon, said member defining an internal surface;

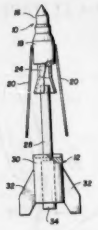
a longitudinal buffer supported by said member and interposed between said light source and said internal surface for cushioning said light source from shock upon recoil of said weapon; and

shock absorbing materials disposed laterally of said light source for preventing damage to said light source due to lateral impact.

4,295,290
TOY PROJECTILE

George T. Boswell, Springfield, Va., assignor to Frontier Industries, Inc., Springfield, Va.

Filed Jul. 1, 1980, Ser. No. 164,909
Int. Cl.[3] A63H *27/00*
U.S. Cl. 46—74 C 10 Claims



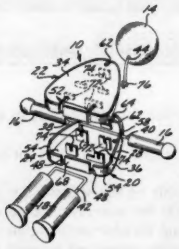
1. A toy projectile having an upper stage and a lower stage, said upper stage comprising a plurality of vanes movably mounted thereon for movement between a closed, substantially longitudinally extending position and an open, substantially radially outwardly extending position, means for biasing said vanes to said open position, and an adaptor portion disposed on the lower end of said upper stage and comprising a downwardly opening tubular section; and

said lower stage comprising a first tubular portion having an upper end adapted to be received within said tubular section of said adaptor portion to removably secure said lower stage to said upper stage, means mounted on said first tubular portion for engaging the lower portions of said vanes to retain them in said closed position when said upper and lower stages are removably connected, and means mounted in the lower end of said first tubular portion for propelling said projectile and for separating said upper and lower stages to enable the lower portions of said vanes to move away from said retaining means, whereby said biasing means moves said vanes to said open position.

4,295,291
TOY FIGURE HAVING REPOSITIONABLE HEAD AND LIMBS

Osamu Fukui, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1979, Ser. No. 90,414
Claims priority, application Japan, May 1, 1979, 54-58486[U]
Int. Cl.[3] A63H *3/20*
U.S. Cl. 46—161 4 Claims



1. A toy doll figure comprising:

a plurality of limb members configured to simulate limb members such as arms and legs of a humanoid;

a head member configured to simulate a humanoid head;

an approximately triangularly-shaped hollow body member having a front portion and a rear portion, each portion having a substantially flat panel respectively corresponding to the front and the back of the toy doll figure and a peripheral rim disposed substantially at a right angle to the flat panels, the body member being assembled from the front and rear portions so that the rims are in contact with one another, the rims having apertures approximately aligned with the respective positions of the limb members and head members and one or more of the front portions and rear portions having an aligned aperture with a rim aperture extending across its flat panel to form a continous slot that extends across the right angled interface of the flat panels and the rim, each limb member having a substantially flat mating surface with a substantially circular periphery to permit a juxtapositional mounting of the respective limb members flush against the body member; the rim aperture for the arm limb members positioned to enable the arms to extend vertically upward relative to a horizontal support surface;

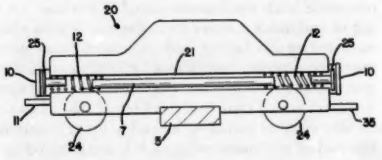
resilient connectors are fixedly attached to each limb member and head member and are attached within the hollow body member to permit limited relative movement between the body member and each limb member and the head member;

at least a pair of rib members are mounted respectively on the front portion and the rear portion within the hollow body member to secure at least one resilient connector, the respective rib members extend upward from the interior of the flat panel members respectively and are spaced apart from the peripheral rim, one of the respective rib members is configured with a groove to receive a portion of the resilient connector while the other rib member is configured with a flat surface to hold the resilient connector within the groove whereby the head member and the limb member may be selectively placed in at least two positions at the option of a player.

4,295,292
DEMOLITION DERBY TOY

Stella Fitzgerald, Las Vegas, Nev., and Bryan Beaver, 3660 Boulder Hwy. - Space 129, Las Vegas, Nev. 89121, assignors to Bryan Beaver, Las Vegas, Nev.

Filed Dec. 11, 1979, Ser. No. 102,436
Int. Cl.[3] A63H *11/10*
U.S. Cl. 46—201 8 Claims



1. A demolition derby toy which comprises, in combination,

(a) a vehicle,

(b) shaft means slidably positioned in said vehicle along a vehicle axis and greater in length than said vehicle axis in said vehicle along which it lies,

(c) removable vehicle component means spanning a vehicle axis and removable from said vehicle in response to movement of said shaft means against said removable vehicle component, and

(d) ram means on said vehicle extending outwardly from said vehicle beyond a removable component means, wherein each said shaft means includes a shaft, a spring on each end of said shaft and a disc on each said spring, the distance between said discs being greater than the length of the vehicle along the shaft axis, said movable component means spanning said discs, said vehicle having grooves on opposite sides of said discs, said removable component means being

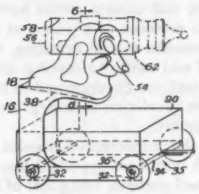
removably positioned in said grooves and capable of both inward and outward movement in said grooves.

4,295,293

NURSING BOTTLE HOLDER

Paul S. Baclit, 2167 College View Dr., Monterey Park, Calif. 91754

Filed Apr. 4, 1980, Ser. No. 137,289
Int. Cl.³ A63H *17/26*; A47D *15/00*
U.S. Cl. 46—202 **2 Claims**



1. A nursing bottle holder in conjunction with a pull toy, forming a combination toy, wherein,

the bottle holder includes a main support member adapted to be placed in an active position over an infant in lying position, and having its longitudinal dimension in the head-to-body direction of the infant, and having a top wall element and depending side elements with bottom surfaces engageable with the surface the infant is lying on, said bottom surfaces being shaped to contact said surface and support said main member stably thereon,

a bottle support demountably supported on the main support member, and a bottle carriage supported in the bottle support for positioning a bottle carried thereby for feeding by the infant,

the depending side elements having vertical slots opening from said bottom surfaces in longitudinally spaced positions therealong, and

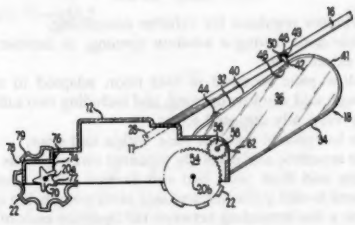
the pull toy having axles and wheels supporting a body, and the main support member being fitted over the body of the pull toy, with the slots receiving the axles, and the pull toy supporting the nursing bottle holder, thereby constituting the combination toy.

4,295,294

TOY LAWN MOWER

Donald A. Rosenwinkel, Tinley Park; Burton C. Meyer, Downers Grove, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Apr. 11, 1980, Ser. No. 139,467
Int. Cl.³ A63H *11/10*
U.S. Cl. 46—205 **12 Claims**



1. A toy power tool comprising:

a housing in the shape of a power tool;

wheel means mounted on said housing for rotation when said housing is pushed over a surface; and,

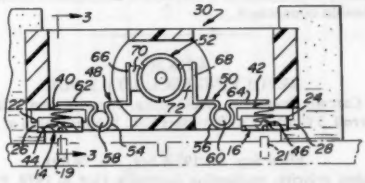
enclosure means extending away from said housing for holding particulate matter, said enclosure means including a bed of particulate matter and agitating means mounted within said enclosure means for creating a cloud-like particulate suspension of said matter in air, said agitating means including a rotatable brush mounted adjacent one end of said enclosure means, a lower end of said enclosure means conforming to the path of movement of said agitating means so that said particulate matter is contacted by said agitating means and dispersed within the interior of said enclosure means when said toy is pushed over a surface, said agitating means being operably connected to said wheel means and said enclosure means including a transparent region to make said cloud-like suspension visible from outside said enclosure means.

4,295,295

PICK-UP SHOE AND MOTOR CONTACT ASSEMBLY FOR TOY VEHICLE

Derek A. Brand, Camarillo, and Derek R. Brand, Carpenteria, both of Calif., assignors to Tyco Industries, Inc., Moorestown, N.J.

Filed Mar. 17, 1980, Ser. No. 130,757
Int. Cl.³ A63H *18/12*; F42B *13/34*; H02K *21/26*
U.S. Cl. 46—259 **26 Claims**



1. A pick-up shoe and motor contact assembly for a toy vehicle having a chassis and a motor for powering the vehicle, the motor having commutator segments, comprising:

a least one conductive brush arm for contacting the commutator segments of the motor,

said brush arm being moveable with respect to the motor commutator segments,

at least one conductive pick-up shoe depending from the vehicle chassis,

resilient means disposed in contact relation with said pick-up shoe and said brush arm for resiliently urging said pick-up shoe downwardly while resiliently urging said brush arm against the motor commutator segments,

said resilient means being adapted to conduct electrical current between said pick-up shoe and brush arm.

4,295,296

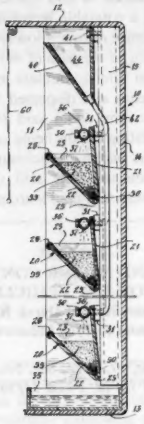
VERTICAL GARDEN

Michael H. Kinghorn, 178 Bible St., Cos Cob, Conn. 06807

Filed Jan. 14, 1980, Ser. No. 111,863
Int. Cl.³ A01G *25/00*
U.S. Cl. 47—82 **14 Claims**

1. An upright garden assembly for culture of vertical garden displays comprising a plurality of elongated open top growing troughs, said troughs having front and rear sides and drain apertures, support frame means for separately removably supporting said troughs horizontally one above the other to form a substantially vertically extending row of trays with the drain apertures of each trough positioned and directed toward said rear side to cause drainage to be directed to the rear of the rear sides of the troughs thereunder, a water container mounted above said row, a separate horizontal distribution conduit mounted above each trough and having irrigation aperture means for directing water to the respective trough, and plural

separate tubes extending substantially directly downwardly from the lower portion of said water container, each tube being



releasably terminated in a respective distribution conduit in a removable connection.

4,295,297

REVOLVING SECURITY DOOR

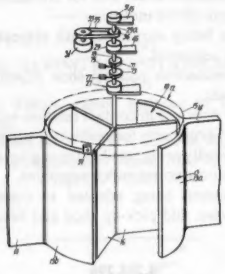
Noel Carroll, Poet's La., Sherbrooke, Victoria, and William F. Carroll, 5 Garden Ct., Wheelers Hill, Victoria, both of Australia

Filed Sep. 24, 1979, Ser. No. 78,491

Claims priority, application Australia, Oct. 6, 1978, PD6263; Aug. 2, 1979, PD9865

Int. Cl.³ E05D *15/02*

U.S. Cl. 49—42 **3 Claims**



1. The security door comprising:

(a) a revolving door assembly having an upright shaft and a plurality of outwardly extending upright door panels secured thereto, said door assembly being arranged for rotation about the axis of said shaft,

(b) an enclosure extending around said revolving door assembly and presenting two opposed portions one to either lateral side of the revolving door assembly and each extending from an entrance to the security door to an exit thereof, the said opposed portions being so arranged that, as the said revolving door assembly revolves about said axis, there are always at least two said panels in position adjacent the upright inner surface of each respective said opposed portion to define a separate closed space between each respective opposed portion and the two adjacent said panels, whereby a person passing through the security door must move around said axis between an adjacent pair of said panels under rotation of the revolving door assembly, and through a said substantially closed space,

(c) an electric motor,

(d) a reduction gear drive coupled to said motor and to said shaft for driving of said shaft by operation of said motor through said reduction gear drive,

(e) rotation controlling means permitting revolving of said revolving door assembly about said axis in one direction but precluding operation in the other direction,

(f) a control circuit controlling operation of said motor for effecting revolving of the revolving door assembly in said one direction, said control circuit having a detector for detecting the presence of a person at said entrance and operating, pursuant to said detecting, to then cause said operation of said motor to revolve said revolving door assembly in said one direction and to brake the motor at the end of one revolution to stop revolving of the revolving door assembly,

(g) an electric clutch mechanism coupled to said shaft,

(h) a mat switch positioned in said enclosure adjacent to one of said opposed portions, being that of said opposed portion which must be passed by a person attempting passing through the security door from said exit to said entrance when said revolving door assembly revolves in said one direction, said mat switch being located such that it must be stepped on by such person attempting passing; said clutch mechanism and said mat switch being interconnected with said control circuit whereby said clutch mechanism is energized under control of the control circuit to lock said shaft against rotation thereof when a person steps on said mat switch whereby in use a person so stepping on the mat switch is trapped in the said substantially closed space then defined adjacent to the said one opposed portion.

4,295,298

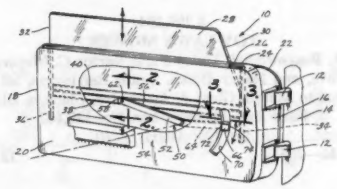
WINDOW REGULATOR

Richard A. Pundt, 4118 Hickory Hill La. SE., Cedar Rapids, Iowa 52403

Filed Aug. 27, 1979, Ser. No. 70,178

Int. Cl.³ E05F *11/14*

U.S. Cl. 49—353 **3 Claims**



1. A window regulator for vehicles comprising,

a vehicle door having a window opening, an interior side and exterior side,

a window pane recessed in said door, adapted to move through said window opening, and including two substantially vertically disposed edges,

a guide bar on said window pane within said door,

a single eccentric arm pivotally mounted away from its ends within said door with one end thereof being movably secured to said guide bar, and said pivot point being offset below a line extending between the opposite ends of said arm whereby the opposite ends of said arm move in substantially opposite directions,

an arcuate slot in said door being substantially vertically disposed and positioned forward from and concentrically about said pivot point,

a handle on the other end of said eccentric arm and being recessed within said arcuate slot and extending interior-

ally through said slot no further than the interior of said door, and

means connected to said door between the sides thereof and adapted to slidably receive the edges of said window pane.

4,295,299

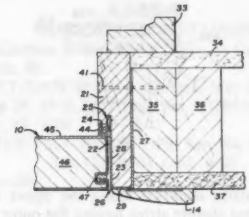
STEEL CLAD WOOD DOOR FRAME

David M. Nelson, Kewanee, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Oct. 9, 1979, Ser. No. 83,133

Int. Cl.³ E06B *1/04*

U.S. Cl. 49—504 **6 Claims**



1. A door frame comprising wood frame members including a strike jamb, a hinge jamb, and a header, said frame members each being recessed longitudinally to provide a rabbet having a major surface and a minor surface perpendicular to said major surface, a slot substantially coplanar with a major surface of said rabbet extending into a non-recessed portion of said member and along substantially the entire length of said member, and a substantially J-shaped metal frame reinforcing member extending along substantially the entire length of said member and having a major flange, a minor flange substantially parallel to said major flange, and a connecting web substantially perpendicular to said major and minor flanges, said minor flange engaging the major surface of said rabbet and extending into said slot, and the major flange of said reinforcing member extending in engagement with the outer surface of said member.

4,295,300

FLAP ARRANGED ON DISCHARGE AND SEPARATING DEVICES OF VIBRATORY ABRASIVE CONTAINERS

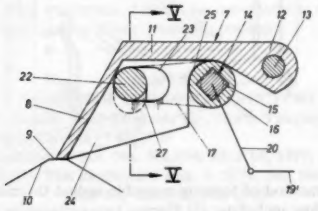
Carl K. Walther, Wuppertal-Vohwinkel, and Karl Temme, Wuppertal-Elberfeld, both of Fed. Rep. of Germany, assignors to Carl Kurt Walther GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,807

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2923414

Int. Cl.³ B24B *31/00*

U.S. Cl. 51—163.2 **13 Claims**



1. In discharge and separating devices of vibratory abrasive containers forming a trough and having a flap for the placing into operation a separating path which is coordinated behind the flap, the flap being swingable around an axis of the flap shaft which is transverse to the container trough and being able to be moved upwardly by means of an actuating device into a maximum upper position, the improvement comprising

a control lever operatively connected to the actuating device being pivotally mounted under a portion of flap parallel to the flap shaft,

the control lever having a free end formed with a pin,

the flap being formed with an elongated slot having an end region,

the pin engaging into the slot in the flap and constituting means for limiting the upward movement of the flap by abutting against the end region of the slot.

4,295,301

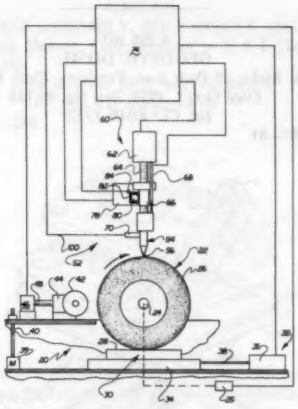
DRESSING APPARATUS WITH MEANS FOR DETECTING GRINDING WHEEL WEAR

Charles F. Barth, Parma; Thomas S. Stelson, Richmond Heights, and David E. Blake, Cleveland Heights, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Nov. 8, 1979, Ser. No. 92,623

Int. Cl.³ B24B *53/00*

U.S. Cl. 51—165.88 **8 Claims**



1. An apparatus comprising a grinding wheel having a circular side surface for use in grinding a workpiece, a member, motor means for moving said member toward the circular side surface of said grinding wheel from a retracted position in which said member is spaced from the circular side surface of said grinding wheel, drive means for rotating said grinding wheel as said member moves toward the circular side surface of said grinding wheel, detector means for detecting when said member initially engages the circular side surface of said grinding wheel, and control means for effecting operation of said motor means to move said member toward the side surface of said grinding wheel in incremental steps and for interrupting movement of said member between steps for a time period sufficient to enable said drive means to rotate said grinding wheel through at least one complete revolution.

4,295,302

INFLATABLE TENT

Morris Liu, 5, Alley 21, Lane 172, Sec. 1 Keelung Rd., Taipei, Taiwan

Filed Oct. 9, 1979, Ser. No. 82,941

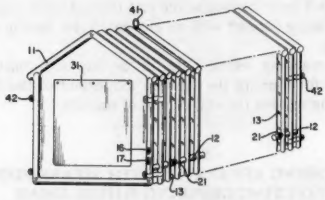
Claims priority, application Taiwan, Aug. 21, 1979, 6823010

Int. Cl.³ E04B *1/345*

U.S. Cl. 52—2 **4 Claims**

1. An inflatable tent substantially comprising a plurality of inflatable frames for supporting the tent; an air passage tube for

interconnecting the frames and permitting air to flow therein; a plurality of blockage studs installed on the air passage tube for partitioning the air system inside the tent into several isolated parts; a waterproof layer of plastic film integrally formed with the frames and the air passage tube for filling the gaps between the frames and between the frames and the air passage



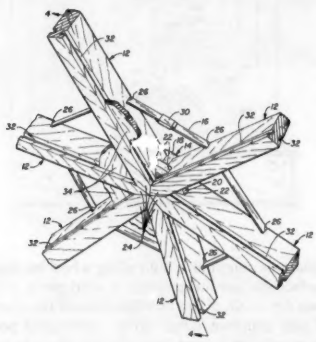
tube; the frames, the air passage tube, and the plastic film are multi-layer structured and all comprise an inner layer of soft plastic film and an outer layer of reinforcing netted plastic material; and inlet and an outlet for receiving or releasing air respectively; and a plurality of handles for easy set up of the tent.

4,295,303

GEODETIC DOME

Wilmer A. Klebe, 35 Park Ave., Petaluma, Calif. 94952

Filed Oct. 1, 1979, Ser. No. 80,743
Int. Cl.[3] E04B *1/32;*
U.S. Cl. 52—81 **25 Claims**



1. A joint for a geodetic dome structure comprising:
a spool having an outer surface including a radially projecting circumferential spline;
a plurality of beams having ends abutting the outer surface of the spool and engaging the spline to prevent movement of the beams axially with respect to the spool, each said beam having engaging means spaced from the end of the beam in abutment with the spool; and
a tension member passing through the engaging means in the beams and coplanar with the spool to retain the beams against the spool and prevent movement of the beams radially with respect to the spool.

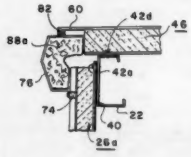
4,295,304

PREFABRICATED PANEL CONSTRUCTION SYSTEM

Kwon S. Kim, Oklahoma City, Okla., assignor to Star Manufacturing Company of Oklahoma, Oklahoma City, Okla.

Filed Apr. 4, 1978, Ser. No. 893,435
Int. Cl.[3] E04B *7/02;* E04C *1/10*
U.S. Cl. 52—90 **10 Claims**

1. A prefabricated building system having an arrangement of support members disposed on a foundation for supporting the walls and roof of a building, comprising:
a plurality of panels of generally rectangular shape adapted to be joined edge to edge to form walls and a roof;
each panel having a foamed insulating core disposed between the interior and exterior metal sheets, the metal sheets having strengthening corrugations running generally parallel to side edges and transversely to end edges of the panels;
trim disposed at the juncture of the walls and the roof to form a weather-tight enclosure,



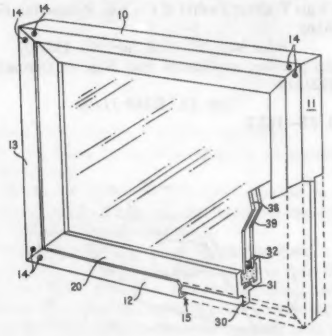
first closure strips disposed along the upper ends of the walls, the first closure strips having flat outer surfaces for attaching the trim and inner surfaces conforming to the corrugated exterior of the wall panels;
second closure strips disposed on an upper surface of the trim along a side of the building running transversely to the corrugations in the roof panels adjacent thereto, the second closure strips having flat lower surfaces for mounting on the trim and upper surfaces conforming to corrugated exterior of the roof panels;
the roof panels having an end flap portion of the exterior metal sheet extending beyond the foamed core to overlie and make a seal with the second closure strips.

4,295,305

THERMAL GLASS STRUCTURE AND METHOD FOR FORMING SAME

Lyle N. Shelver, 5020 Ambrose Dr., Reno, Nev. 89502

Continuation-in-part of Ser. No. 585,299, Jun. 9, 1975, Pat. No. 4,033,087, which is a division of Ser. No. 460,277, Apr. 12, 1974, Pat. No. 3,889,434. This application Dec. 23, 1976, Ser. No. 754,033
Int. Cl.[3] E06B *7/12*
U.S. Cl. 52—172 **2 Claims**



1. The method of forming a couble-walled thermally insulated window including: (1) Placing two rectangular panes of glass of the same size and shape upon a spacer containing desiccant material adjacent the edges of said panes of glass; (2) providing a coating of waterproof mastic about the edges of the panes of glass and the desiccant and spacing material so as

to form one unit; (3) cutting a length of pliable material to the length which equals the length of all four edges of the rectangular unit as formed, and cutting three slits into said pliable material at those positions which will allow three corners of the said glass unit to protrude through said slits and wherein the slits are cut at such a distance that the fourth corner extends through the pliable material where the two cut ends of the pliable material are brought together, and placing said pliable material about the edges of said unit as formed; (4) placing adaptive elements of rigid material about said pliable material on each side of the unit; and (5) fastening the corners of the adaptive elements together.

4,295,306

WINDOW CLIP RETAINER

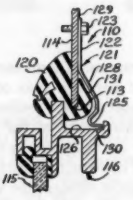
Ronald H. Garman, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00365, § 371 Date May 29, 1979, § 102(e) Date May 29, 1979, PCT Pub. No. WO80/02676, PCT Pub. Date Dec. 11, 1980

PCT Filed May 29, 1979, Ser. No. 89,118

Int. Cl.³ B60J *1/02, 1/08*

U.S. Cl. 52—208 **24 Claims**



1. In a window assembly (10,110,210, 310,410,510) having a pane (15,115,215,315,415,515) provided with a peripheral frame (16,116,216,316,416,516), and resilient mounting means (20,120,220,320,420,520) extending about the periphery of the frame for resiliently sealingly mounting the frame to a wall portion (14,114,214,314,414,514) defining an opening (13,113,213,313,413,513) for receiving the window assembly, said resilient mounting means providing the normal sole mounting of the frame to said wall portion, the improvement comprising a motion limiting means comprising:

a substantially rigid retainer (21,121,221,321,421,521) having a mounting portion (22,122,222,322,422,522), and a retaining portion (25,125,225,325,425,525); and

securing means (23,123,223,323,423,523) for fixedly securing said mounting portion to one of said wall portion and said frame, said retaining portion being disposed adjacent the other of said wall portion and frame with a preselected spacing therebetween in the normal position of the frame as supported by said resilient mounting means to prevent dislodging of the window assembly from the wall portion in the event of relative movement between the wall portion and frame permitted by said resilient mounting means reaching a preselected maximum movement as determined by said spacing of said retaining portion.

4,295,307

MODULAR BUILDING STRUCTURE

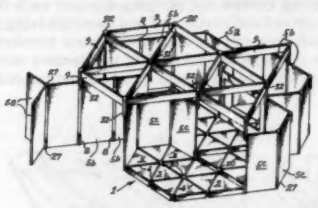
David C. Jensen, 2357 Riverside Dr., North Vancouver, British Columbia, Canada (V6B 1C8)

Continuation of Ser. No. 796,974, May 16, 1977, Pat. No. 4,186,533. This application Aug. 6, 1979, Ser. No. 63,761

Int. Cl.³ E04B *1/343, 2/28*

U.S. Cl. 52—236.1 **22 Claims**

1. A freestanding, post-free modular building structure comprising an array of upright modular panels; panel-connecting means connecting adjacent edges of adjacent panels in said array; three overhead beam members, said beam members being horizontal and assembled in coplanar triangular relationship; and beam-and-panel connecting means connecting each end of said beam members with one adjacent beam member end with said beam members in such triangular relationship



and interconnecting said interconnected beam member ends and said modular panels for supporting said interconnected beam members entirely above the upper edges of said array of panels with at least one of said beam members being parallel to at least one of said panels.

4,295,308

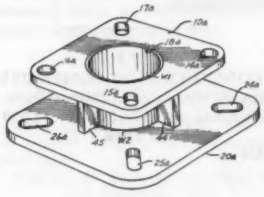
POLE BASE ASSEMBLY, BOLT CIRCLE ADAPTOR

Carl Korfanta, Denver, Colo., assignor to K S L Corporation, Denver, Colo.

Filed Oct. 26, 1979, Ser. No. 88,530

Int. Cl.³ E04H *12/00*

U.S. Cl. 52—296 **4 Claims**



1. An adapter for pole bases having a bolt hole configuration different than the bolts formed in a concrete foundation, comprising:

(a) a generally square bottom plate having elongated bolt holes set on radials from the center of said plate for mating over the bolts in a concrete foundation, and having a large central circular bore;

(b) a generally square top plate having elongate bolt holes set on radials from the center of said plate for mating with bolt holes on a pole base which are of a different configuration than the bolts on the concrete foundation, and having a central circular bore;

(c) a short length of pipe welded into the bores of said bottom and top plates to rigidly hold said plates parallel and provide space for manipulating attaching nuts and bolts, and

(d) at least four spacers welded to the top and bottom plates securing the plates rigidly and strongly together and spaced a predetermined distance apart, said spacers being spaced uniformly around said short length of pipe.

4,295,309

LOAD SUPPORT STRUCTURE

Clarence J. Hornbeck, Allentown, Pa., assignor to Follett Corporation, Easton, Pa.

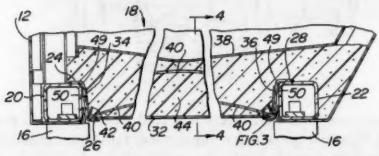
Filed Oct. 1, 1979, Ser. No. 80,885

Int. Cl.³ E04C *1/26*

U.S. Cl. 52—309.7 **20 Claims**

1. Apparatus comprising a housing having at least one wall

for resisting forces within the housing, said wall comprising a tension member on an outer surface thereof and at least one arched compression member inwardly thereof, said compression member being juxtaposed to the tension member and spaced therefrom except for the end portions thereof, said members having curved end portions adjacent each free end thereof, the curved end portions of said members being welded together, each free end of said compression member being spaced from the adjacent free end of said tension member, a low modulous filler between said members and bonded to the



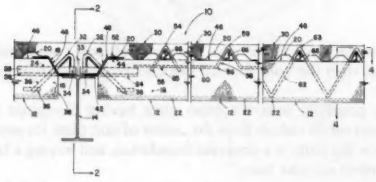
juxtaposed surface of each of said members so that force supplied to one of said members will be resisted in part by the shear and tension strength of the filler, and means for supporting said members on said housing at or adjacent the focal points for minimizing residual bending moments including at least one hanger on opposite sides of the end portions of said tension member, each hanger having one end fixedly anchored to a support on said housing and which is stationary with respect to said wall, each hanger having its other end fixedly secured to the tension member at a location spaced from the ends of the tension member.

4,295,310

PRECAST CONCRETE JOIST COMPOSITE SYSTEM

Ira J. McManus, 39 Lincoln Ave., Florham Park, N.J. 07940

Filed Aug. 22, 1979, Ser. No. 68,830
Int. Cl.³ E04B *1/16*
U.S. Cl. 52—334 **41 Claims**



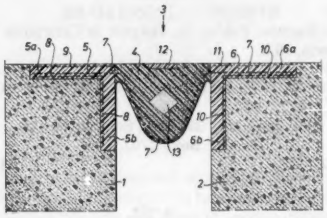
1. A precast concrete joist composite system, comprising:
(a) support means;
(b) at least first and second space apart precast concrete joist members supported at their respective ends by said support means, each of said joist members having a concrete portion, said concrete portions comprising respective end faces, said joist members comprising at their said end portions respective projecting structures that have first parts anchored in said concrete portions of their respective joist members and second parts extending from said concrete portions, said joist members including end faces, said end faces having respective portions thereof that slope downward and away from said concrete portions, said concrete portions comprising respective top surfaces; said projecting structure second part being at least partly disposed on said support means;
(c) at least a first pan element that is disposed at said end face, a first part of said pan element being disposed over said top surfaces of said concrete portions and a second part thereof disposed over said sloping portions of said end faces;
(d) a decking element disposed over the respective said top surface of said first and second joist members and spanning the space between said joist members and part of said first pan element.

4,295,311

EXPANSION JOINT ELEMENT

Anders Dahlberg, Täby, Sweden, assignor to Tätis Plasttätningar AB, Täby, Sweden

Filed Nov. 28, 1979, Ser. No. 98,047
Claims priority, application Sweden, Dec. 1, 1978, 7812402
Int. Cl.³ E01C *11/04*; E04B *1/68*
U.S. Cl. 52—396 **6 Claims**



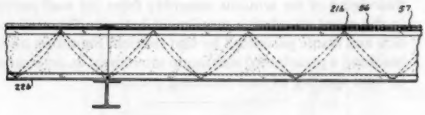
1. A pre-fabricated expansion joint element for forming an elongated surface joint between two concrete construction parts, comprising an intermediate resilient member, substantially consisting of an elastic material, and side elements adjoining at each side thereto, and respectively adapted to be secured to one of the concrete construction parts, said side elements being constituted by profile elements of an epoxy plastic having reinforcing means, said profile elements being securable by adhesion directly onto the edge portions of the concrete construction parts, the intermediate resilient member having a thickened central portiion, at least one of said reinforcing means being integrally cast into both of the profile elements as well as into the intermediate resilient member, and the external surface of the intermediate resilient member being connected to and substantially in alignment with the external surfaces of the profile elements.

4,295,312

BUILDING CONSTRUCTION

Henry F. Campbell, Belleville, Mich., assignor to Campbell Research Corporation, Detroit, Mich.

Filed Jan. 22, 1979, Ser. No. 5,473
Int. Cl.³ E04B *1/40, 7/00*
U.S. Cl. 52—408 **7 Claims**



1. A building construction comprising a panel comprising spaced sheets and a plurality of spaced longitudinally extending prefabricated truss members,
each said truss member comprising a pair of channels and an undulating member comprising alternating first and second apices connected by legs, the apices being bonded to said channels,
at least one of said sheets having a plurality of transversely spaced longitudinally extending grooves receiving the truss members,
said grooves having a cross sectional configuration conform-

ing to the cross sectional configuration of the channel of said truss member,

and means for fastening said last-mentioned channel to said sheet,

said sheet having said grooves therein including a partially extending groove along each longitudinal edge in which a truss member is positioned, the corresponding channel of the truss member including a base wall and side walls, the free edge of the sheet terminating along the base wall of the channel, adjacent panels being positioned such that they extend parallel with one another in side-by-side relation,

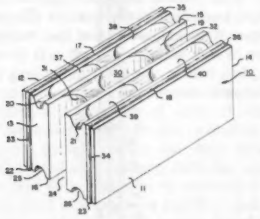
a plurality of said panels, means defining a joint between adjacent panels comprising a member which has a generally T-shaped section including a web extending between the flanges of adjacent truss members of panels and engaging the free edges of said flanges of the adjacent channels of said truss members and arms extending laterally outwardly and including portions extending inwardly against the sides of the partial groove in the sheet member.

4,295,313

BUILDING BLOCKS, WALL STRUCTURES MADE THEREFROM AND METHODS OF MAKING THE SAME

John N. Rassias, c/o Intralock Systems International Corporation, 565 Park Ave., New York, N.Y. 10021

Filed Dec. 10, 1979, Ser. No. 102,251
Int. Cl.³ E04B *2/68*
U.S. Cl. 52—438 **10 Claims**



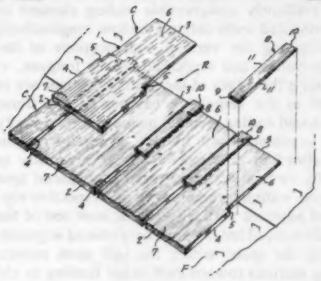
1. A substantially rectangular masonry building block having a pair of spaced opposite generally parallel side walls, spaced top and bottom faces and a pair of spaced end faces, a pair of spaced apart ribs on said top face, one adjacent and spaced from each side wall, a pair of mating recesses on said bottom face, an intermediate generally centrally extending horizontal groove in each of the top and bottom faces, a pair of narrower grooves, one on either side of said centrally extending groove on each of said top and bottom faces and spaced from said ribs and mating recesses and from said intermediate groove, a pair of spaced ribs on one end face, a pair of mating grooves on the other end face, said ribs and grooves being aligned with the ribs and recesses on the top and bottom faces, an intermediate vertical passage in said block corresponding in width to the widest portion of the central grooves on said top and bottom faces, a pair of vertical passages on each side of said intermediate vertical passage connecting the pair of top and bottom narrower grooves, and a vertical recess in each end face intermediate the side walls and having a cross section substantially equal to one half of said intermediate vertical passage.

4,295,314

SHOULDERED SHAKE AND FILLER ROOF STRUCTURE

Stewart Ferguson, P.O. Box 12, Aloha, Wash. 98525

Filed Jul. 23, 1979, Ser. No. 59,998
Int. Cl.³ E04D *1/00*
U.S. Cl. 52—553 **16 Claims**



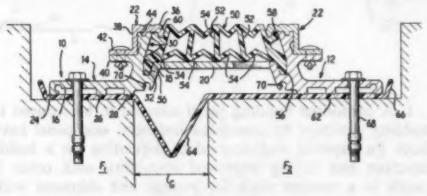
1. In a roof including generally rectangular individual covering elements having respective butt and tip ends and applied in generally coplanar, side adjacent relationship in each of several overlapping courses, the improvement comprising the adjacent sides of adjacent covering elements in a course having respective shoulders extending transversely of such sides, each shoulder dividing its covering element into respective tip and butt portions of unequal width, and a filler fitted between such adjacent sides and abutting said shoulders.

4,295,315

EXPANSION JOINT COVER

David M. Lynn-Jones, Muncy, Pa., and R. Gordon Stewart, Georgetown, Canada, assignors to Construction Specialties, Inc., Cranford, N.J.

Filed Oct. 23, 1978, Ser. No. 953,775
Int. Cl.³ E04B *1/68*
U.S. Cl. 52—573 **3 Claims**



1. An expansion joint cover for bridging the space between adjacent sections of a building on opposite sides of an expansion gap comprising a pair of elongated extruded rigid frame members adapted to be anchored to the respective sections, each of the frame members including a generally vertical wall portion and a multiplicity of longitudinally spaced apart, substantially horizontal plate-like tongues integral with and supported in cantilevered relation by the vertical wall portion at locations spaced from the upper edge of the wall portion and in longitudinal alignment, each tongue being a vestigial segment of a longitudinally continuous flange from which pieces corresponding to the spaces have been removed, the longitudinal spacings between adjacent tongues of each frame member being not less than the widths of the tongues of the other frame member such that in the cover as installed in the expansion gap the tongues of each frame member project into the spaces between the tongues of the other frame member and a generally longitudinally continuous bridge is formed by an interven-

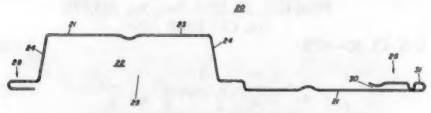
ing of end portions of the tongues of each of the frame members between end portions of the tongues of the other along the expansion gap, and wherein each frame member includes a longitudinally continuous flange extending generally inwardly from the vertical wall portion toward the expansion gap and spaced apart from and located above the tongues, the flange defining with the tongues a longitudinal inwardly open cavity, and a resiliently compressible sealing element composed of interconnected walls defining hollow longitudinally elongated cells engaging the vertical wall portions of the respective frame members and supported by the tongues, wherein portions along the edges of the sealing element are received and retained in the respective cavities of the frame members, wherein said sealing element includes a multiplicity of longitudinally continuous side by side, generally rectilinear hollow cells defined in cross section by transversally spaced apart generally vertical walls and vertically spaced apart generally transverse walls interconnecting the respective top and bottom edges of adjacent vertical walls, at least one of the transverse walls of each cell having angularly related segments adapted to fold into the space within the cell upon movement of the building sections toward each other tending to close the gap, said transverse walls having angularly related segments being the top walls on every other cell along the width of the element and the bottom walls of the remaining cells, the number of side by side cells of the sealing element being an uneven number not less than five, and the top wall of the center cell having angularly related segments, and wherein the vertical walls defining the center cell extend higher above the tongues than the vertical walls of the remaining cells, the top of the walls of the center cell being generally flush with the upper surface of the flanges of the frame members.

4,295,316

NESTABLE BUILDING WALL PANEL

Lawrence E. Carlson, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 2, 1977, Ser. No. 792,782
Int. Cl.³ E04C *1/10*
U.S. Cl. 52—588 **1 Claim**



1. A contoured building panel adapted to be secured to a building structure by concealed fasteners, said panel having faces for exposed and concealed disposition on a building structure and having improved nestability with other like panels in a vertical stack for storage and shipment with a relatively short stack height, comprising:

(a) a body portion including at least one longitudinally extending channel therein having opposed sidewalls substantially continuously diverging from the bottom of the channel to the mouth of the channel to permit nesting of the channels of stacked panels, each of said diverging sidewalls defining an angle of 5° to 80° measured between said sidewall and a plane passing through the sidewall near the mouth of the channel and normal to the general plane of said panel;

(b) lateral edge structures along opposite sides of said body portion for engagement with an opposite edge structure of an adjacent panel;

each of said edge structures projecting outwardly substantially laterally from the mouth of the channel in said body portion, having leg portions substantially lying in a plane parallel to the general plane of said panel with no portion of each of said edge structures projecting inwardly beyond the periphery of its respective side of said body portion, and having a maximum extent measured perpendicular to the general plane of said panel no more than 25% of the extent of the channel measured in the same direction, the perpendicular extent being determinative of the nesting height of stacked panels;

at least one of said edge structures having a reverse bend therein forming a groove open laterally inward of said panel for receiving at least a portion of the opposite edge structure of an adjacent panel for engaging said panels in a tension joint;

(c) a fastening edge portion on the edge structure which has said reverse bend therein and disposed laterally outwardly of the open mouth of said groove and adapted to receive fastening means to secure said panel to a building structure with the fastening means underlying said body portion of the adjacent panel for concealing the fastening means; and

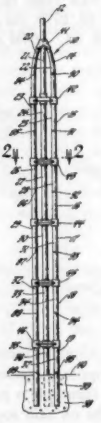
(d) the angle of the diverging sidewalls of the channel being a function of the maximum perpendicular extent of said edge structures so that said like panels when vertically stacked contact adjacent panels along the leg portions of said edge structures and along said diverging sidewalls of said channel for increasing support surfaces of nested panels.

4,295,317

MODULAR TOWER AND METHOD OF CONSTRUCTING SAME

Willem R. VanTielen, Rte. No. 3, Box 17, East Jordan, Mich. 49727

Filed Jun. 14, 1979, Ser. No. 48,482
Int. Cl.³ E04H *12/00*
U.S. Cl. 52—637 **6 Claims**



1. A modular tower comprising, in combination, substantially identical first and second tower sections, each tower section including at least two substantially identical parallel vertical columns, each of said columns having a hollow first end defined by an inside and outside diameter and a second end defined both by an outside diameter that is slightly smaller than said first end inside diameter and also by a shoulder, said second column ends in said first section being inserted in said first column ends in said second section until each of said first column ends abuts said shoulder on one of said second column ends; a brace assembly for connecting said sections, said brace assembly including a plurality of tubes and a plurality of support members rigidly connecting said tubes, each of said tubes being defined by a vertical axis and an inside diameter slightly larger than the outside diameter of said first column end, said brace assembly being positioned so that each of said tubes substantially surrounds one of said first column ends in said

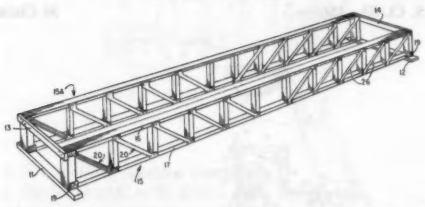
first section at a point where one of said second column ends is inserted in said one first column end; and connecting means for rigidly securing said brace assembly to each of said first and second column ends at a point where said first and second column ends are surrounded by tubes in said brace assembly so as to fasten each of said tubes to first and second column ends in said tubes whereby one of said sections is supported on the other of said sections.

4,295,318

CONNECTOR FOR WOODEN TRUSS

Milton Perlman, Miami Beach, Fla., assignor to Monex Corporation, North Miami Beach, Fla.

Filed Jul. 26, 1979, Ser. No. 60,912
Int. Cl.³ E04C 3/02
U.S. Cl. 52—693 **2 Claims**



1. A unitary metal connector for interconnecting spaced-apart chord members of a wooden truss structure, wherein said truss structure includes a plurality of wooden studs extending between the parallel spaced-apart chord members, said connector comprising an elongated generally rectangular support member having a central stiffening rib extending longitudinally thereof and side flanges formed thereon and extending therefrom substantially normal thereto along the side edges of said rectangular support member, said connector further including two end plates respectively integrally formed with said support member at the opposite ends thereof, each of said end plates being generally rectangular in shape and coplanar with said support member and being oriented with respect to said support member so that the longitudinal axis of said support member extends generally diagonally of said end plates; each of said end plates having fastening means integrally formed therewith consisting of a plurality of rows of aligned barbs struck from the associated end plate and extending therefrom substantially normal thereto and in the same direction, said barbs being configurated and arranged such that said fastening members are adapted to be respectively embedded in the two associated spaced-apart wooden truss members and into opposite ends of spaced wooden studs extending therebetween, for attachment thereto and to provide a strengthening interconnection therebetween.

4,295,319

FLOOR PANEL

Kary A. Griffin, Dallas, Tex., assignor to G. H. Products, Inc., Dallas, Tex.

Filed Oct. 31, 1979, Ser. No. 90,018
Int. Cl.³ E04B 2/28
U.S. Cl. 52—785 **4 Claims**

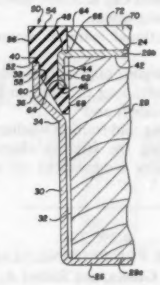
1. A floor panel for use in elevated floor assemblies, the panel comprising:

a noncompressible solid core having a side;

a bottom metal sheet having an upwardly deflected edge formed about a periphery of the bottom, the edge forming a first shoulder;

a top metal sheet having a downwardly deflected edge, said edge spaced from the side of said core and inwardly of said first shoulder, said edge further forming a second shoulder, and said top metal sheet and bottom metal sheet being positioned on opposed sides of said core; and

a flexible edge member having an outer shoulder engaging said first shoulder on said bottom metal sheet and an inner channel formed in said flexible edge member having an upper inner shoulder engaging the upper surface of said top metal sheet and a lower inner shoulder engaging said second shoulder of said top metal sheet, the channel receiving said deflected edge of said top metal sheet to prevent rotation of the flexible edge member, said flexible



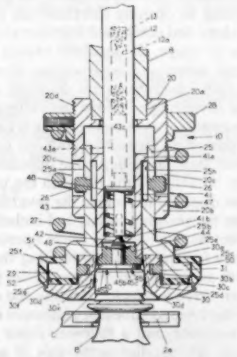
edge member being wedged between the upward deflected edge of the bottom metal sheet and the downward deflected edge of the top metal sheet, and said flexible edge member further having an abuttment surface formed adjacent said channel and lower inner shoulder, the abuttment surface having a substantially flat, wide surface preventing inward rotation of the edge member to engage a side of said core.

4,295,320

CLOSURE CONVERSION APPARATUS FOR EXISTING CLOSURE APPLICATING MACHINES

Wendell D. Willingham, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 9, 1980, Ser. No. 94,514
Int. Cl.³ B67B 3/20; B65B 7/28
U.S. Cl. 53—201 **5 Claims**



1. In a capping machine of the type having a rotating turret arranged to successively move the plurality of bottles around its perimeter and including means for loosely positioning a threaded cap on the threaded neck of each bottle, a continuously rotating cap applicator shaft located above each bottle and movable therewith around the turret, and means for moving each applicator shaft downwardly towards the respective bottle for a portion of the peripheral path of the bottle around the turret, the improvement comprising a capping head carried by each applicator shaft including the following elements:

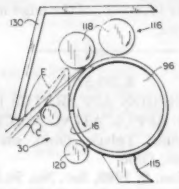
(1) an annular housing assembly adapted to be rigidly secured to the lower end portions of the cap applicator shaft;
(2) an annular cap actuator assembly mounted for rotation relative to said annular housing assembly, said annular cap actuator assembly having means on its inner wall for engaging a cap positioned on a bottle in the turret to rotate the cap;
(3) a pair of annular radial surfaces respectively provided on said housing and said cap actuator assembly and disposed in axially spaced alignment;
(4) a washer of frictional material mounted between said radial surfaces;
(5) resilient means urging said radial surfaces towards each other, thereby controlling the amount of friction exerted on said friction washer, and
(6) means for shielding said friction washer from ambient air, thereby maintaining the friction characteristics of said washer substantially independent of ambient humidity conditions.

4,295,321

ENVELOPE PROCESSING MACHINE

John R. DeHart, Coral Gables, and Robert A. Majewski, Homestead, both of Fla., assignors to Docutronix, Inc., Homestead, Fla.

Filed Jul. 9, 1979, Ser. No. 56,275
Int. Cl.³ B65B *43/30*
U.S. Cl. 53—381 R **17 Claims**



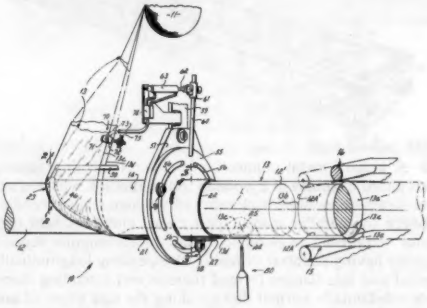
1. In a machine for advancing a pre-opened envelope and separating the envelope from its contents, the envelope having two panels defining an opening therebetween along a leading edge of the envelope and connected together along the remaining edges of the envelope, the machine having feeding means for receiving and advancing an envelope along a generally predetermined path, severing means disposed along the path for engaging the advancing envelope and cutting it inwardly of its opposite side edges to sever connections between the panels along opposite side edges thereof leaving one panel connected to the other panel along a trailing edge opposite the one edge and the contents in juxtaposition between the two panels, and separating means disposed to receive the severed envelope and its contents from the severing means and including a cylindrical vacuum drum having vacuum ports opening through its peripheral surface for engaging and holding the one panel in engagement with an associated portion of the peripheral surface of the drum, drive means for rotating the drum about its axis to advance the severed envelope and move it in a direction away from its contents, and a follower roller journalled for rotation about an axis parallel to the axis of said drum, said follower roller and said drum defining a nip therebetween through which said advancing severed envelope and its contents are constrained to pass, the improvement wherein said separating means includes an extraction roller journalled for rotation about an axis parallel to said drum axis and angularly spaced about said drum axis from said follower roller axis and in the direction of drum rotation for engaging the contents as the contents advances through said nip and along a path generally tangent to the peripheral surface of said drum, means for rotating the extraction roller about its axis, and abutment means in the path of the leading edge of the other panel for engaging the other panel as it advances through said nip and along a path generally tangent to the peripheral surface of said drum and biasing the other panel toward the contents and the extraction roller to urge the contents toward engagement with the extraction roller.

4,295,322

TUBE FORMING SHOE AND METHODS OF FORMING A FLEXIBLE WEB INTO A TUBE

Peter Kuipers, Taylors, S.C., assignor to Nordson Corporation, Amherst, Ohio

Filed Oct. 15, 1979, Ser. No. 85,044
Int. Cl.³ B65B *9/00*
U.S. Cl. 53—450 **36 Claims**



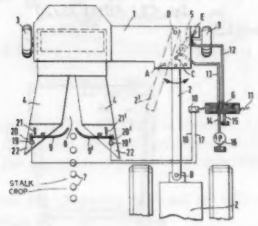
1. Apparatus for forming a flexible web into a tube, said apparatus including a tube forming shoe comprising:
a tubular shoe having an entry end and an exit end,
said entry end being defined by a web brake edge,
said brake edge including a plurality of fluid ports directed outwardly for blowing fluid onto said web near said brake edge and for holding said web away from said brake edge where said web bends around said brake edge and when it is pulled through said shoe, and
said brake edge having a forward curved portion which, when developed in a flat plane, has a radius approximately equal to the interior diameter of said shoe, and said brake edge further including straight portions extending from each side of said curved portion.

29. A method of forming a flat flexible film web into a tube-shaped film having a longitudinal seam, said method including the steps of:
introducing said web to one end of a tube forming shoe at an angle with respect to a longitudinal axis of said shoe,
bending said film around a curved brake edge of said shoe, said brake edge having a formed curved portion which, when developed in a flat plane, has a radius approximately equal to the interior diameter of said shoe, and said brake edge further including straight portions extending from each side of said curved portion,
drawing said film across said brake edge of said shoe and guiding said film into a tubular shape while pulling said film through said shoe,
blowing fluid from said edge against said film to hold said film away from said brake edge as said film is bent around said brake edge and pulled through said shoe, and
including the further step of sensing changes of position of an edge of said film prior to said bending and rotating said shoe in response to the change of position of said edge to adjust film position in said shoe.

4,295,323
TOWED CROP HARVESTER

Martin Maier; Josef Pürrer, both of Gottmadingen, and Ronald Clemens, Allensbach, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG (Zweigniederlassung Fahr), Gottmadingen, Fed. Rep. of Germany

Filed Mar. 28, 1980, Ser. No. 135,080
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912715
Int. Cl.³ A01D *75/28*
U.S. Cl. 56—10.2 3 Claims



1. A harvesting machine comprising:

a chassis adapted to be drawn along the ground;

a harvesting mechanism on said chassis having a crop engaging mouth and adapted to harvest stalk crop guided into said mouth upon the movement of the chassis along the ground along a row of crop to be harvested;

a tow bar pivotally connected to said chassis and adapted to be attached to a tractor to enable the chassis to be towed thereby;

a hydraulic cylinder pivotally connected to said chassis and to said tow bar at respective locations spaced from the pivot between said tow bar and said chassis whereby hydraulic pressurization of said cylinder varies the angular orientation of said tow bar and said chassis about said pivot;

two lateral guide feelers swingable on said chassis on opposite sides of said mouth responsive to the said position of said row; and

control means connected between said feeler and said cylinder for pressurizing said cylinder in response to said feeler to align said mouth with said row, said control means including

a hydraulic pump,

a multiposition valve connected between said pump and said cylinder and having a valve-actuating solenoid,

respective double-pole switches operatively connected with said feelers and actuated thereby each of said switches including a normally closed fixed contact opened by the pivoting of the respective feeler upon engagement with a stalk of said crop and a normally open fixed contact closed by said pivoting of the respective feeler and respective movable contacts assigned to said fixed contacts and connected to the respective feeler,

first circuit means electrically connecting the normally closed fixed contact of one of said switches to the normally open fixed contact of the other switch and the normally open fixed contact of said one of said switches to the normally closed fixed contact of said other switch,

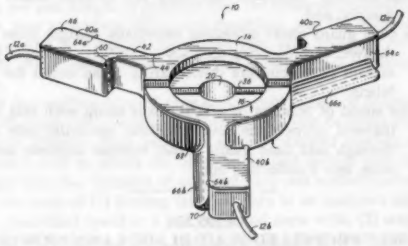
second circuit means connecting the movable contacts associated with said normally closed switches together and to an electric current source, and

third circuit means connecting the movable contacts associated with said normally open switches to terminals of said solenoid.

4,295,324
BALANCED MOWER HEAD FOR CARRYING A PLURALITY OF MONOFILAMENT LINES

Alfred A. Frantello, Satellite Beach, Fla., and Lester R. Kefauver, Knoxville, Tenn., assignors to Corinco, Inc., Knoxville, Tenn.

Filed Jun. 30, 1980, Ser. No. 164,093
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—12.7 10 Claims



1. A head for carrying a plurality of monofilament lines suitable for being mounted on the shaft which secures the blade of a conventional rotary mower said head comprising:

a head body defining an upper surface and a lower surface, and a centrally positioned bore extending through said head body, one end portion of said bore opening on said upper surface and the further end portion of said bore opening on said lower surface, said bore being proportioned for receiving said shaft,

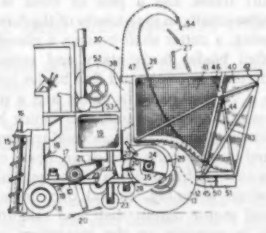
a plurality of line holders extending outwardly from said body, each of said line holders including a first end portion joined with said body at annularly spaced locations, and an outboard end portion, said outboard end portion defining an opening therethrough having an axis substantially perpendicular to the axis of said bore in said body, each of said line holders defining a leading surface, and

a grass lifting blade carried by the leading surface of each line holder, said blade serving to generate air currents in a vertical direction during operation of said mower to stand the vegetation up during the cutting operation.

4,295,325
SUGAR CANE HARVESTER

Christopher J. Cannavan, Iona Rd., Home Hill, Queensland, Australia (4806)

Filed Sep. 10, 1979, Ser. No. 74,051
Claims priority, application Australia, Sep. 15, 1978, PD5981
Int. Cl.³ A01D *45/10*
U.S. Cl. 56—13.9 5 Claims



1. A sugar cane harvester of the type having a mobile frame, a base cutter on the frame for cutting cane stalks at or near to ground level as the harvester advances, a chopping cutter on the frame, means for feeding cut cane stalks to the chopping cutter which cuts them into billets, and means for elevating and

discharging the billets, wherein the chopping cutter and elevating means include:

a rotary cutter having a knife blade on a rotatable shaft,

a vaned thrower, rotatable about an axis parallel to that of the rotary cutter shaft,

means for counter-rotating the rotary cutter and the rotary thrower,

the rotary cutter knife blade coacting with a vane of the thrower to sever cane fed thereto into billets,

the thrower thereafter throwing the severed billets upwardly, and

a cane guard chute extending essentially upright from the thrower and receiving such severed billets, the upper part of said chute curving downwardly to an outlet for the billets,

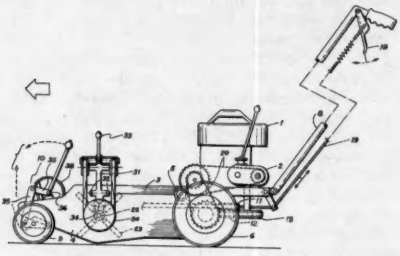
the speed of rotation of said thrower being such that said thrower propels the severed billets upwardly into and through said cane guard chute, without separate assistance, into a collecting bin.

4,295,326

SELF-PROPELLED FLAIL BLADE LAWN MOWER

Douglas F. Green, Brisbane, Australia, assignor to Royer Mowers (Aust.) Pty. Ltd., Brisbane, Australia

Filed Mar. 10, 1980, Ser. No. 129,092
Claims priority, application Australia, Nov. 4, 1977, PD2313
Int. Cl.³ A01D *50/02*
U.S. Cl. 56—11.3 **6 Claims**



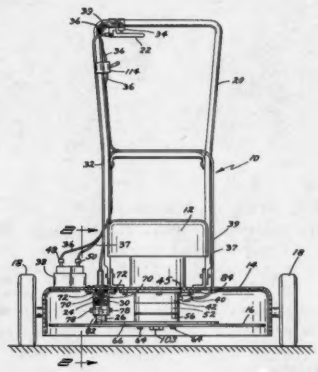
1. A self-propelled flail blade lawn mower comprising a support frame having forward and rearward ends, a handle assembly extending upwardly and rearwardly from said rearward end and a cutter housing extending forwardly of said forward end, said support frame and said cutter housing being affixed to a common cross member extending transversely across the support frame whereby the cross member supports the forward end of the support frame and the rearward end of the cutter housing, a rear axle and wheel assembly rotatably supported substantially in the vicinity of the rearward end of said support frame and a pair of front wheels rotatably mounted substantially in the vicinity of the forward end of said cutter housing, a cutter shaft bearing a plurality of pivotally mounted flail blades horizontally and rotatably supported within said cutter housing, said flail blades being adapted for rotation in a vertical plane, a motor and a transmission box mounted on said support frame, said motor having a downwardly extending output shaft and said transmission box having input and output shafts, first drive means operatively connected between said transmission box output shaft and said rear axle and wheel assembly, second drive means connectable between said motor output shaft and said transmission box input shaft in response to the movement of a first lever mounted on said handle assembly, third drive means connectable between said motor output shaft and said cutter shaft in response to the movement in one direction of a second lever mounted on said cutter housing, and brake means operable to prevent rotation of said cutter shaft in response to the movement of said second lever in a direction opposite to said one direction.

4,295,327

MAGNETIC SAFETY CLUTCH FOR ROTARY LAWNMOWER

Everest J. Bortolussi, 3148 Louisiana Ave. N., Minneapolis, Minn. 55427

Filed Jun. 5, 1980, Ser. No. 156,692
Int. Cl.³ A01D *75/20*
U.S. Cl. 56—11.3 **4 Claims**



1. A magnetic safety clutch apparatus for use with a rotary lawnmower having a main frame, a prime mover mounted on said frame, a prime mover drive shaft extending downwardly of said main frame, a rotary lawnmower blade adaped to be rotated by said drive shaft on a vertical axis, and a lawnmower operating handle mounted to a said main frame, said apparatus including:

A. a source of electromotive force on said frame;

B. a magnetic flux-producing coil fixedly mounted to said main frame in concentric, surrounding relation to said drive shaft;

C. a housing of electromagnetic material encompassing said coil;

D. a first magnetic clutch plate fixed to said drive shaft to rotate therewith and situated in close relationship to said coil housing to provide a low reluctance path between said first clutch plate and said housing;

E. a second magnetic clutch plate mounted to rotate with said blade and freely rotatably mounted with respect to said drive shaft and movable axially of said drive shaft between an engaged, drive transmitting, position and an unengaged position with respect to said first clutch plate;

F. means to limit axial movement of said second clutch plate to retain it within the effective magnetic field of said coil when energized;

G. a lever action hand switch mounted to said operating handle to be readily accessible to an operator of said lawnmower, said hand switch being biased to be normally situated in an inoperative condition and being manually movable to and maintainable in an operative condition; and

H. circuit means including said hand switch, said circuit means being operative to electrically connect said magnetic coil to said source of electromotive force when said hand switch is in its operative condition and to disconnect said coil from said source when said hand switch is in its inoperative condition.

4,295,328

HOLDING MEANS FOR GRAIN LIFTERS, SUPPORT SKIDS AND THE LIKE

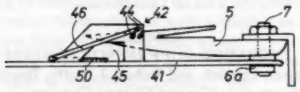
Gustav Schumacher, II, Gartenstrasse 8, and Günter Schumacher, Raiffeisenstrasse 10, both of 5231 Eichelhardt, Fed. Rep. of Germany

Filed Aug. 3, 1979, Ser. No. 63,478

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835505; Jul. 17, 1979, 2928871

Int. Cl.³ A01D *55/10*

U.S. Cl. 56—313 **19 Claims**



1. Holding apparatus for coupling a resilient, substantially flat support leg of a grain lifter, support skid or the like, to a cutter finger of the cutter mechanism of a harvester, comprising:

clamping means for clamping one end of said support leg with respect to said cutter finger;

a retention bracket fixed to said support leg at a location spaced from said clamping means, said retention bracket including a pair of upstanding legs, each of which extends from said support leg on a respective side of said cutter finger upwardly beyond the same; and

locking means located vertically above said cutter finger and extending between said upstanding legs of said retention bracket so that said cutter finger is received in the space defined between said support leg, said locking means and said pair of upstanding legs of said retention bracket;

whereby said support leg can be resiliently biased in a manner such that said locking means engage said cutter finger and said pair of upstanding legs of said retention bracket prevent the latter from unhooking from said cutter finger during up-and-down movement of said resilient support leg when engaging ground irregularities.

4,295,329

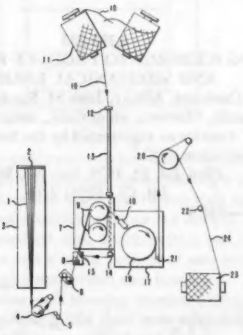
COBULKED CONTINUOUS FILAMENT HEATHER YARN METHOD AND PRODUCT

William T. Windley, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 10, 1980, Ser. No. 158,120

Int. Cl.³ D02G *1/16, 1/18, 3/24*

U.S. Cl. 57—245 **23 Claims**



1. An improved composite cobulked continuous filament yarn containing a first oriented continuous multifilament yarn which has been bulked in a hot fluid jet process simultaneously with a second oriented continuous multifilament yarn, the filaments of both yarns being randomly intermingled throughout the length of the composite yarn and having random three-dimensional curvilinear filament crimp with frequently alternating regions of S and Z filament twist, the filaments of said second yarn being from about 4% to about 20% longer in said composite yarn than the filaments of said first yarn, wherein the improvement comprises: the filaments of said first and second yarns being of polymers containing the same type of chemical dye site with the filaments of said second yarn having a substantially greater concentration of said dye site in equivalents per unit weight of polymer than the filaments of said first yarn, thus providing differential dyeability, and the filaments of said first yarn and of said second yarn each comprise from about 25% to about 75% of the total denier of said composite yarn.

13. In a method of producing a composite cobulked continuous filament yarn containing filaments of a first oriented continuous filament yarn and of a second oriented continuous filament yarn in which the filaments of said second yarn are longer than the filaments of said first yarn said method including the steps of (1) feeding said first yarn in an undrawn state at a controlled speed to a pair of heated draw rolls, (2) wrapping said first yarn around said draw rolls a sufficient number of times to avoid slippage thereon and said rolls being driven at surface speed at least twice the feeding speed of said first yarn thereby applying tension to and drawing to molecularly orient said first yarn, (3) also feeding to said pair of draw rolls from a yarn package at a tension of less than 1.0 grams per denier said second yarn having a lower shrinkage potential in a hot gas bulking jet than said first yarn, (4) wrapping said second yarn around said draw rolls to prevent slippage thereon, (5) bringing said first and second yarns together and forwarding the combined yarns in a high velocity stream of hot turbulent fluid in a confined space which randomly crimps and entangles the filaments thereof and thereby forms a composite cobulked yarn in which the filaments of said second yarn are from about 4% to about 20% longer than the filaments of said first yarn, (6) removing the cobulked yarn from the stream of hot fluid and cooling it at low tension while the filaments are in a crimped condition to set crimp in the filaments and (7) winding the cobulked yarn into a package under tension, the improvement for making a heather dyeable yarn comprising: feeding to said draw rolls as said second yarn a heat-relaxed yarn containing crimped filaments which filaments are differentially dyeable with respect to the filaments of said first yarn and which filaments constitute from about 25% to about 75% of the total denier of the cobulked yarn.

4,295,330

RE-ATTACHMENT DEVICE FOR AN OPEN-END TYPE SPINNING FRAME

Hermann Pfeifer, Geneva, Switzerland, assignor to Officine Savio, S.p.A., Pordenone, Italy

Filed Jun. 24, 1980, Ser. No. 162,502

Claims priority, application Switzerland, Jun. 26, 1979, 5936/79

Int. Cl.³ D01H *15/02;* **B65H** *54/26, 67/08*

U.S. Cl. 57—263 **10 Claims**

1. Re-attachment device for an open-end type spinning frame, comprising:

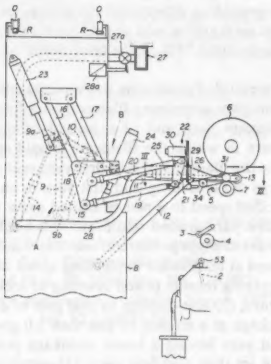
means to lift a cop from its drive shaft, means to drive the movement of said cop in the direction in which it is unwound, a suction conduit having an inlet to remove and aspirate the end of the yarn from the periphery of said cop, a first perforated roller next to said conduit installed coaxially with an axis crosswise to the inlet end of said conduit, an outlet pipe for the yarn coming from a spinning unit, means to transfer the yarn between said cop and said outlet pipe, an organ to shear the yarn, a drive organ, said first perforated roller and a second roller connected to said drive organ, said drive organ having a reversible direction so as to introduce the yarn into a rotor through

said outlet pipe for the yarn and then to pull it back again as soon as it is re-attached;

a third roller fitted so as to rotate near to the outlet of the aforesaid pipe;

said second roller cooperating with said first roller positioned next to said suction conduit and associated with said drive organ;

a portion of said suction conduit next to said first roller being installed so as to rotate around the lengthwise axis of said conduit;



a positioning organ connected to said portion of the suction conduit serving to position it between two angular positions located 180° from each other;

said organ to shear the yarn being installed within said suction conduit; and

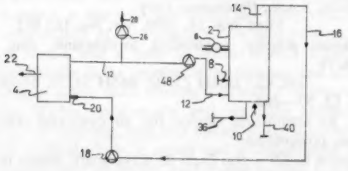
a part of the suction conduit next to its rotating portion solidly fixed to said transfer means enabling movement of said first perforated roller from a first position next to the cop in one angular position of said rotating portion to a second position next to said third roller installed near the outlet of the outlet pipe of the yarn in the other angular position of said rotating portion.

4,295,331

PROCESS FOR THE PRODUCTION OF ENERGY FROM SOLID HYDROCARBON FUELS

Uriel Rekant, Kovlosky St. 22/5, Kiryat Herzog, Bnei Brak, Israel

Filed Jan. 31, 1979, Ser. No. 8,199
Claims priority, application Israel, Mar. 7, 1978, 54214
Int. Cl.³ F02B *43/08*
U.S. Cl. 60—39.02 **6 Claims**



1. A process for the production of energy from solid hydrocarbon fuels selected from the group consisting of ground coal, shale, and peat comprising:

(a) conveying solid hydrocarbon fuel by means of a continuous conveyor through a reactor substantially filled with CO_2 and raising the temperature within said reactor to at least about 400° C. whereby in the substantial absence of air said solid hydrocarbon fuel reacts endothermically with said CO_2 to form CO;

(b) conveying the relatively light CO and other accompanying gases from the top of said reactor to a combustion chamber for exothermic reaction of the CO gas with O_2 to form CO_2 and to generate both heat and gas pressure energy;

(c) recycling at least a portion of the gases exiting from said combustion chamber to a reactor for reaction with solid hydrocarbon fuel; and

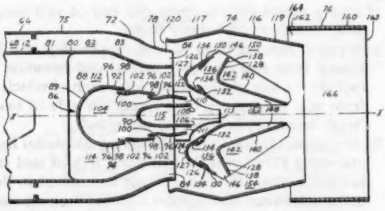
(d) collecting for further industrial processing and use the waste product of said hydrocarbon fuel reaction with CO_2 by discharging the waste product from said continuous conveyor.

4,295,332

INFRARED SUPPRESSOR SYSTEM

William Steyer, Ipswich, and Robert J. Duffy, Boxford, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Nov. 13, 1978, Ser. No. 960,351
Int. Cl.³ F02K *3/00, 7/00*
U.S. Cl. 60—264 **15 Claims**



1. In an apparatus for suppressing infrared radiation emitted from hot metal parts at the aft end of a gas turbine engine and from the stream of hot exhaust gases flowing therefrom during operation of the engine, the invention comprising:

duct means for receiving the stream of hot exhaust gases from said engine, said duct means adapted to generally confine said exhaust gases to flow through said duct;

first splitter means disposed within said duct means for splitting said gas stream into first and second flowing gas streams; and

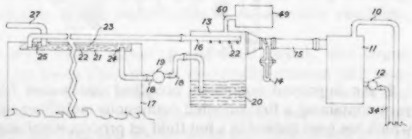
second splitter means disposed within said duct means downstream of said first splitter means for splitting each of said first and second gas streams, said first and second splitter means cooperating to obstruct the line of sight viewing of said hot metal parts when said engine is viewed from the aft direction.

4,295,333

MELTING ICEBERGS TO PRODUCE FRESH WATER AND MECHANICAL ENERGY

Wayne M. Camirand, Albany; John M. Randall, El Cerrito, and Earl Hautala, Martinez, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 11, 1979, Ser. No. 56,652
Int. Cl.³ F03G *7/04*
U.S. Cl. 60—641.6 **24 Claims**



1. A method of melting an iceberg to produce fresh water in

an amount greater than that available from the melting of the iceberg and mechanical energy, which comprises—

(a) evaporating warm surface seawater to produce water vapor,

(b) generating mechanical energy from said vapor,

(c) condensing said vapor by contacting it directly and intimately with cold melt water from the iceberg to produce a mixture of condensed vapor and melt water from the iceberg, said mixture having a temperature and a volume greater than the cold melt water alone,

(d) contacting the so-produced mixture with the body of the iceberg to melt the iceberg and produce cold melt water, said contact being made in such a manner as to produce turbulent flow of the cold melt water,

(e) separating a portion of the so-produced mixture and cold melt water as fresh water produce, and

(f) cycling the remainder of the so-produced mixture and cold melt water for direct and intimate contact with said vapor,

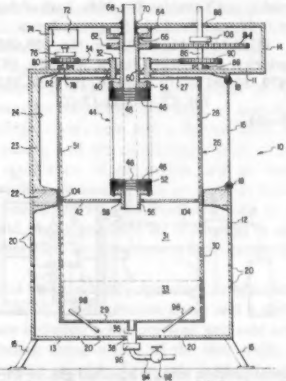
the amount of said fresh water produced being greater than the amount of cold water obtained from melting of the iceberg.

4,295,334

PARAMETRIC ENERGY CONVERTER

Richard N. Johnson, 14411 Quince Orchard Rd., Gaithersburg, Md. 20760

Filed Dec. 3, 1979, Ser. No. 99,368
Int. Cl.³ F01K *11/02*
U.S. Cl. 60—669 **10 Claims**



1. A parametric energy converter, which comprises:

a housing comprising a rotary boiler having a substantially cylindrical inner and outer wall, a top wall and a bottom wall which substantially enclose the ends of said boiler, and an intermediate wall which defines and separates an upper portion and a lower portion of said boiler;

a fluid mass positioned within said housing;

means for rotating said housing about a center of rotation thereby compressing said fluid mass against said substantially cylindrical inner wall of said boiler;

means for heating said fluid mass for causing said fluid mass to move toward said center of rotation; and

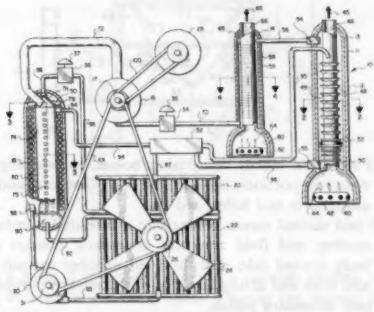
means positioned at said center of rotation for extracting the resultant kinetic energy of said fluid mass.

4,295,335

REGENATIVE ABSORPTION ENGINE APPARATUS AND METHOD

VerDon C. Brinkerhoff, 917 Park Row, Salt Lake City, Utah 84105

Continuation-in-part of Ser. No. 868,117, Jan. 9, 1978, abandoned. This application May 14, 1979, Ser. No. 39,035
Int. Cl.³ F01K *25/06*
U.S. Cl. 60—673 **11 Claims**



1. A regenative absorption engine comprising:

a closed cycle system comprising a first fluid having a first, lower boiling point and a second fluid having a second, higher boiling point, said second fluid having a relatively high degree of absorptivity for the first fluid;

distillation means for separating the first fluid from the second fluid by selectively vaporizing the first fluid, the distillation means comprising a first column having a coaxial first flue in spaced relationship inside the first column and a plurality of perforated, inverted, frustoconical distributor rings mounted to the first flue, the distributor rings directing incoming third fluid into thermal contact with the first flue for more efficient heat transfer into the third fluid, the third fluid including the first fluid and the second fluid, the trays being spaced from the internal wall of the first column for the upward passage of vaporized first fluid inside the first column, the first flue directing heated combustion products upwardly through the first column;

superheater means for superheating the vaporized first fluid;

mechanical expansion engine means downstream of the superheater means, the mechanical expansion engine means converting thermal energy of the first fluid into mechanical energy; and

absorption means downstream of the mechanical expansion engine means, the absorption means providing absorption of the first fluid from the mechanical expansion engine means with the second fluid while reducing backpressure in the first fluid, the absorbed first fluid in the second fluid comprising a third fluid.

4,295,336

MASTER CYLINDER ASSEMBLY WITH DETACHABLE RESERVOIR

Edward J. Falk, St. Louis, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Filed Feb. 5, 1980, Ser. No. 118,781
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **2 Claims**

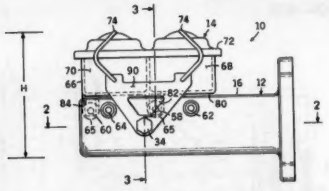
1. A master cylinder assembly comprising:

(a) a body having a bore therein and having first and second sides;

(b) primary and secondary pistons movably disposed in said bore defining primary and secondary fluid chambers, respectively, in said bore;

(c) a fluid reservoir having depending reservoir portions on one side and a depending bracket on the other side;

(d) first and second means detachably attaching said fluid reservoir to the first and second sides, respectively, of said body so that said depending reservoir portions and said depending bracket straddle said body;



(e) said first means comprising bosses on said depending reservoir portions, holes in said body first side, said bosses engaged in said holes; and

(f) said second means comprising a threaded member connecting said fluid reservoir depending bracket to said body second side, said threaded member extending into said bore and acting as a stop for rearward movement of said secondary piston.

4,295,337

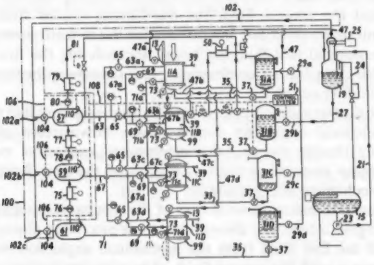
COOLING APPARATUS AND METHOD IN A LIQUID CRYOGEN TREATMENT PROCESS

Harry D. Johnson, Glen Allen; Christopher J. Campbell, Richmond, both of Va.; Thomas O. Turner, Midland; Carl W. Poole, Concord, both of N.C.; James E. Gilmore, and James R. Thomas, both of Mauldin, S.C., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,671

Int. Cl.³ F17C *13/00*

U.S. Cl. 62—54 **11 Claims**



1. In an apparatus for processing a product by treatment with a liquid cryogen, said apparatus including a processing chamber having means for introducing and withdrawing product, a source for supplying cryogen vapor to said chamber at superatmospheric pressure, means for supplying liquid cryogen to said chamber and removing liquid cryogen therefrom and compressing means interconnected to said processing chamber for effecting withdrawal of cryogen vapor therefrom upon removal of liquid cryogen from said processing chamber and compression of such vapor, the improvement comprising:

selectively operable means interconnected between said vapor source and said compressing means for supplying vapor to said compressing means; and

means responsive to a predetermined pressure at said compressing means for acutating said selectively operable vapor supply means, said predetermined pressure being lower than the pressure at said vapor source.

4,295,338

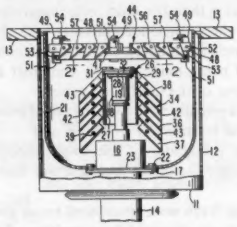
CRYOGENIC PUMPING APPARATUS WITH REPLACEABLE PUMPING SURFACE ELEMENTS

Kimo M. Welch, Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 18, 1979, Ser. No. 86,107

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 **11 Claims**



1. In a cryogenic pumping apparatus having pumping surfaces maintained at a predetermined temperature for condensation and adsorption of gaseous species: a frame having an axially extending core portion and a plurality of fins extending radially from the core portion, a group of axially spaced generally parallel plate members extending outwardly from the core portion between adjacent ones of the fins and inclined at a predetermined angle to the axis of the core portion, a coating of cryosorbent material on one surface of each of the plate members, and removable fasteners securing the plate members to the fins.

4,295,339

CRYOSTAT SYSTEM UTILIZING A LIQUEFIED GAS

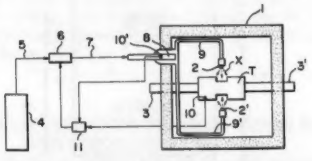
Yasuo Kuraoka, and Yasuhiro Tsuchida, both of Sapporo, Japan, assignors to Hoxan Co. Ltd., Sapporo, Japan

Filed Mar. 11, 1980, Ser. No. 129,485

Claims priority, application Japan, Mar. 14, 1979, 54-29515; May 21, 1979, 54-68174[U]; Nov. 26, 1979, 54-152604

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—64 **1 Claim**



1. A cryostat process using a liquified gas, in which a coolant is fed from a liquified gas source through a heat exanger to be sprayed out from at least one spray nozzle provided in a thermostatic zone onto a material therein, comprising the steps of:

(a) spraying said coolant in the liquid phase as a first cooling step directly onto said material so as to localize the cooling treatment of said material to a limited space, and cooling said material towards an intended cryogenic temperature;

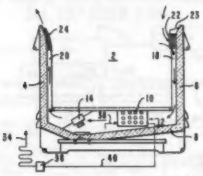
(b) detecting the temperature of said material as it reaches the proximity of said temperature; and,

(c) causing a temperature controller to respond to said detected temperature so as to gasify said coolant for thermostatically controlling the temperature of said material to said intended temperature.

4,295,340
REFRIGERATED DISPLAY CASE HAVING AMBIENT AIR DEFROST

Fayez F. Abraham, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 11,804, Feb. 14, 1979. This application Jul. 25, 1979, Ser. No. 60,459
Int. Cl.[3] A47F *3/04*; F25D *21/12*
U.S. Cl. 62—82 22 Claims



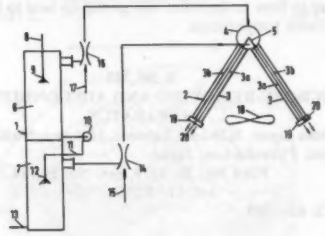
1. An open top refrigerated display case being selectively operative in a refrigeration cycle and a defrost cycle, said case comprising: a bottom wall and four side walls; a single air conduit extending along a first of said side walls, along said bottom wall and a second of said side walls, said first and second side walls being opposing side walls, said air conduit having first and second openings at its opposite ends and each of said openings being located near the top portion of the respective said side wall; means for refrigerating air moving through said conduit during a refrigeration cycle, said means for refrigerating being arranged within said air conduit, air circulating means arranged within said air conduit, said air circulating means circulating within said air conduit in a forward direction during a refrigeration cycle and circulating air in a reverse direction during a defrost cycle, and said air circulating means drawing in ambient air from outside of said display case through said first opening when said air circulating means circulates air within said air conduit in the reverse direction; means for switching operation of said display case between a refrigeration cycle and a defrost cycle and correspondingly causing said air circulating means to change the direction of circulation of air within said air conduit; and means for directing air leaving said air conduit upwardly and over the outside of the adjacent said side wall so as to flow away from said case when such air is flowing in said reverse direction so that such air is prevented from reentering said air conduit.

14. A method for selectively operating an open top refrigerated display case in a refrigeration cycle and a defrost cycle, where the case includes: a bottom wall and side walls, an air conduit extending along a first of the side walls, along the bottom wall and a second of the side walls, the air conduit having first and second openings at its opposite ends and each of the openings being located near the top portion of the respective side wall; the method comprising the steps of: refrigerated air moving through the air conduit during a refrigeration cycle; circulating air within the air conduit in a forward direction during a refrigeration cycle; circulating air in a reverse direction during a defrost cycle; drawing in ambient air from outside of said display case through the first opening when air is circulated within the air conduit in the reverse direction; switching the operation of the display case between a refrigeration cycle and a defrost cycle; and directing air leaving the air conduit upwardly and over the outside of the adjacent side wall so as to flow away from the case when such air is flowing in the reverse direction.

4,295,341
WATER CHILLING PLANT

John A. Gale, Pulborough, England, assignor to A.P.V. Spiro-Gills Limited, West Sussex, England

Filed Sep. 4, 1979, Ser. No. 71,840
Claims priority, application United Kingdom, Sep. 5, 1978, 35666/78
Int. Cl.[3] F25B *19/00*
U.S. Cl. 62—100 9 Claims



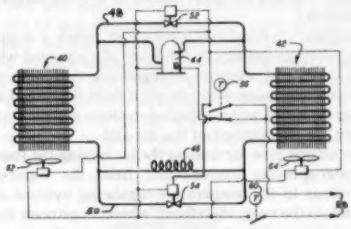
1. In a method of chilling water in a vacuum chilling plant having at least two chilling states wherein the vapour from each chilling state is condensed in a multi stage air-cooled heat exchanger, having an air inlet and an air outlet the improvement comprising:

feeding the vapour to the heat exchanger in at least two separate flows at different states of compression and temperature whereby the cooler air near the air inlet condenses vapour at a lower temperature and the warmer air nearer the air outlet condenses vapour at a higher temperature.

4,295,342
HEAT EXCHANGE METHOD USING NATURAL FLOW OF HEAT EXCHANGE MEDIUM

James Parro, R.D. 2, Sadler Rd., Skaneateles, N.Y. 13152

Continuation-in-part of Ser. No. 845,896, Oct. 27, 1977, abandoned. This application Jul. 10, 1979, Ser. No. 56,419
Int. Cl.[3] F25D *15/00*; F28D *15/00*
U.S. Cl. 62—119 9 Claims



1. A method of reducing energy losses in heating and cooling an enclosed room while ventilating said room with outside air at a temperature below that of said room during heating cycles and above that of said room during cooling cycles by reversible heat exchange between room air and outside air, comprising:

(a) providing a pair of continuous heat exchange coils each having an upper and a lower end and a plurality of substantially horizontal portions therebetween;

(b) placing the upper ends of said coils at a vertical level substantially higher than the lower ends of each coil;

(c) connecting said upper ends for direct communication

therebetween and connecting said lower ends for direct communication therebetween;

(d) charging said coils with a heat exchange liquid to a level substantially above the lower ends and below the upper ends of both of said coils; and

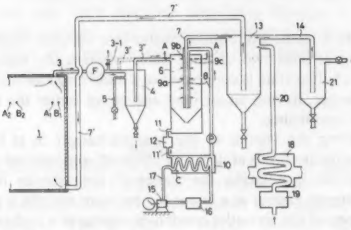
(e) contacting one of said coils with room air and the other with outside air, whereby refrigerant is evaporated from said one coil when room air is warmer than outside air, and vice versa, thereby increasing the pressure in the coil from which refrigerant is evaporated and causing refrigerant to flow to the other coil giving up heat to the air at the lowest temperature.

4,295,343

MICROBE-REMOVING AND AIR-CONDITIONING APPARATUS

Masahiko Izumi, 8,26-ban, 5-chome, Hiikawa, Nishi-ku, Fukuoka-shi, Fukuoka-ken, Japan

Filed Jul. 20, 1979, Ser. No. 59,184
Int. Cl.³ F25D *17/04*
U.S. Cl. 62—309 **2 Claims**



1. A microbe-removing and air-conditioning apparatus comprising

a room;

a water-spraying cyclone, in which a return pipe is surrounded with a water pipe which has a plurality of spraying nozzles, said water-spraying cyclone comprising means through which the air in said room is circulated and in which water is sprayed and odor, fine dust and microbes are caused to adhere to the wall of the cyclone and removed, and the air is caused to become saturated with moisture;

a temperature-regulating cyclone in which a temperature-regulating medium conduit is spirally arranged within said cyclone, said temperature-regulating cyclone comprising means to remove water droplets from the humid air pressing from said water-spraying cyclone and means to regulate the temperature of the air; and

a circulation pipe for feeding the air leaving the room to the water-spraying cyclone and from the water-spraying cyclone to the temperature-regulating cyclone and then back to the room therefrom; wherein upstream the water-spraying cyclone there is provided a sterilization cyclone where a high temperature vapour is introduced and mixed with the air coming from the room to effect sterilization.

4,295,344

REFRIGERATION UNIT WITH WATER

William J. Hannett, Jamesville; Thomas E. Brendel, and David S. Wilson, both of Fayetteville, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

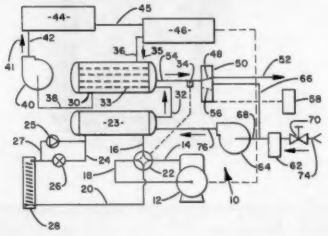
Filed Nov. 8, 1979, Ser. No. 92,297
Int. Cl.³ F25B *13/00, 27/02*
U.S. Cl. 62—324.5 **4 Claims**

1. An engine-driven refrigeration unit including a first heat exchanger functioning as a condenser in a first operating mode and as an evaporator in a second operating mode of said refrigeration unit comprising:

means for delivering water from a source thereof to said first heat exchanger for condensing refrigerant vapor delivered thereto when said heat exchanger is functioning as a condenser, and for vaporizing refrigerant when the heat exchanger is functioning as an evaporator;

a second heat exchanger connected to a source of relatively warm fluid;

a conduit connected to said first heat exchanger for delivering said water to said second heat exchanger to pass in heat transfer relation with said relatively warm fluid to increase the temperature of said water;



discharge means connected to said second heat exchanger including valve means having a first position for directing the water from said second heat exchanger to the source thereof and a second position for directing the water to the inlet of said first heat exchanger; and

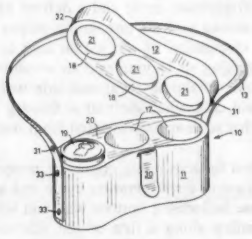
means for placing said valve means in said second position when said first heat exchanger is functioning as a refrigerant evaporator.

4,295,345

COOLING CONTAINER FOR CANNED BEVERAGES

Lyle H. Atkinson, 3828 Pavant Dr., Salt Lake City, Utah 84120

Filed Apr. 21, 1980, Ser. No. 142,384
Int. Cl.³ F25D *3/08*
U.S. Cl. 62—371 **7 Claims**



1. A portable cooling container for transporting and cooling canned beverages, comprising in combination:

a curved bottom housing having a plurality of vertically oriented compartments for holding canned beverages, said housing having walls of insulating material which entirely surround each of said compartments;

a correspondingly curved top housing having walls of insulating material and having a plurality of recessed cavities therein corresponding to said vertically oriented compartments in said bottom housing;

a slow-thawing cooling gel disposed in the upper ends of each respective recessed cavity;

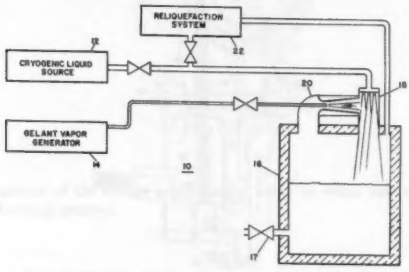
sealing means for sealing the interface between said top housing and said bottom housing; and

means for attaching said bottom housing to said top housing.

4,295,346
RECIRCULATING VAPOR SYSTEM FOR GELLING CRYOGENIC LIQUIDS

Lawrence C. Hoffman, Fair Oaks, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Filed Sep. 8, 1980, Ser. No. 185,349
Int. Cl.³ F25B *1/06*
U.S. Cl. 62—500 **3 Claims**



1. A system for gelling cryogenic liquid comprising:
means for providing a spray of cryogenic liquid droplets;
a vessel for receiving said cryogenic spray;
a jet pump for introducing a gelant into said cryogenic spray disposed to also educt cryogenic vapor from said vessel; and,
means for providing a flow of gelant fluid to said jet pump to thereby drive said pump.

4,295,347
SIMULATED GEM

James Visconti, 55 W. 28th St., New York, N.Y. 10001

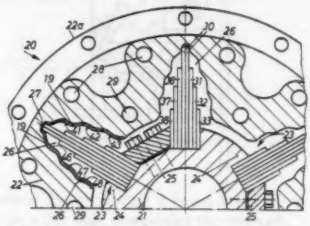
Filed May 25, 1978, Ser. No. 909,347
Int. Cl.³ A44C *17/00*
U.S. Cl. 63—32 **3 Claims**

1. A simulated gem of lacquer and plastic comprising a plastic core and a lacquer coating, said lacquer covering at least the entire outer surface of said core, said lacquer coating including a plurality of hues, said lacquer of said coating when in liquid state having a solvent adapted to superficially interfuse with the surface of said plastic core, said plastic core having a least the periphery of its underside on a single plane and substantially no upper surface concavities, and in the shape of a cobochon said lacquer coating marbled and interfused with the surface of said plastic core when in solid state, whereby the illusion of a solid unitary gem is created.

4,295,348
PROGRESSIVE TORQUE TRANSMISSION IN LEAF-SPRING COUPLING

Friedrich Helfer, Königsbronn-Zang; Ernst Elsner, Herbrechtingen, and Wolfgang Zaiser, Steinheim, all of Fed. Rep. of Germany, assignors to Voith Getriebe KG., Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,373
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2901933
Int. Cl.³ F16D *3/56*
U.S. Cl. 64—27 L **29 Claims**



1. A leaf-spring coupling comprising:
a first coupling part and a second coupling part spaced from said first coupling part;
a plurality of leaf-spring assemblies extending between and coupling said first and said second coupling parts in an elastic manner; each said leaf-spring assembly comprising a plurality of leaf-springs oriented to extend between said first and said second coupling parts, and said leaf-springs of each said assembly being of different lengths, including a longer principal spring and a plurality of flank springs arrayed next to at least one side of said principal spring, wherein the lengths of said flank springs decrease stepwise from spring to spring away from said one side of said principal spring;
said leaf-spring assemblies being clamped to said first clamping part;
said second coupling part including respective stop means for each said assembly which are spaced from said flank springs of that said assembly and are so located with respect to said flank springs that upon relative motion of said first and said second coupling parts in a direction laterally of said leaf-springs, said principal spring engaging said second coupling part and being stressed and flexed by such engagement in a direction away from said flank springs at said one side of said principal springs and said stop means also engaging at least a part of at least some of said flank springs also at said one side, thereby increasing the number of said leaf-springs in a said assembly which are stressed.

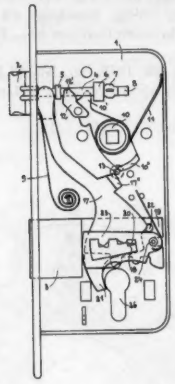
4,295,349
DOOR LOCK

Georg Wasserfaller, Gratschach, A 9523 Post Landskron, Austria

Filed Jan. 15, 1979, Ser. No. 3,465
Int. Cl.³ E05B *59/00*
U.S. Cl. 70—111 **3 Claims**

1. A door lock comprising
(a) a latch reciprocal between an open and a locking position, the latch being biased into the locking position,
(b) a pivotal element having at least one arm engageable with the latch to withdraw it to the open position,
(c) a locking bolt depressable to move into a blocking position to prevent swivelling of the pivotal element to withdraw said latch,
(d) a key-operable unlocking lever for moving the locking

bolt out of the blocking position to permit swivelling of said pivotal element, the unlocking lever having a catch operable by the key, and



(e) a key-bolt key-operable for reciprocation between an open and locked position, the unlocking lever being pivotally mounted on the key-bolt.

4,295,350

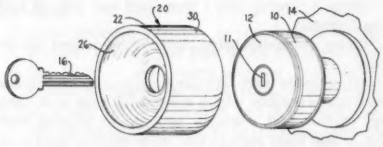
KEYHOLE SIGHTER

Kim D. Grinage, 636 Eire St., South Haven, Mich. 49090

Filed Jan. 18, 1980, Ser. No. 113,013

Int. Cl.³ E05B *15/08*

U.S. Cl. 70—454 **8 Claims**



1. A keyhole sighting device for mounting on a key receiving member at a keyhole in said member, comprising:

a shell having a rearwardly facing base surface for opposing the front surface of said key receiving member, said shell projecting forwardly from said base surface, said shell having a substantially funnel-like interior cavity, said cavity being wide open at the front of said shell and converging rearwardly to a key receiving opening of substantially less diameter through said base surface, said shell having a night visible material along the surface of said funnel-like cavity;

an annular skirt of elastomeric material extending rearward from said base surface for snug telescoping over the key receiving member, said annular skirt having a generally radially inwardly offset annular edge portion at the rear end thereof and circumferentially stretchable to fit over and grip the rear portion of the key receiving member for holding the device on the key receiving member with said key receiving member snugly closed within said skirt, the entire device being an annular one-piece member of said elastomeric material defining said shell and skirt, said member having a substantially cylindrical peripheral surface continuing from the front end of said shell substantially to the rear end of said skirt.

4,295,351

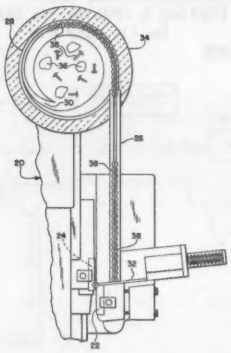
SELF-TAPPING STAINLESS STEEL SCREW AND METHOD FOR PRODUCING SAME

Lowell L. Bjorklund, Elgin, Ill.; Ramon A. Berg, Hales Corners, Wis., and Henry A. Sygnator, Arlington Heights, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 8, 1979, Ser. No. 1,975

Int. Cl.³ B21H *3/06*; B21K *1/56*

U.S. Cl. 72—38 **5 Claims**



1. A process for producing a threaded, self-tapping screw with a thread hardness in the range of RC 45–50 while its core retains a hardness in the area of RC 30, said screw being made from an austenitic 300 series nickel-chromium stainless steel material said method including the steps of forming a headed blank with a shank portion from said 300 series material, chilling at least the shank portion of the thus formed austenitic blank to a temperature substantially below 0° F., rolling the blank between thread-rolling dies forming threads or said shank portion while the blanks are in the chilled condition, said thread-rolling step causing sufficient localized transformation of the material in the region of the threads to martensite to produce the RC 45–50 hardness without substantial effect on a central core portion of said threaded shank.

4,295,352

DIE FOR THE FORMATION OF SEMI-CLOSED CHANNELS OR OTHER COMPLEX CONFIGURATIONS

Richard P. Stokes, and William Stokes, both of Carteret, N.J., assignors to Unlimited Steel Fabricators, Inc., Middlesex, N.J.

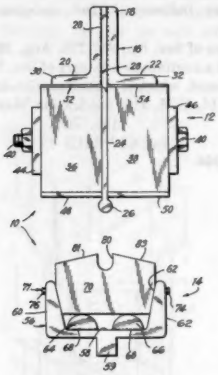
Filed Oct. 12, 1979, Ser. No. 84,179

Int. Cl.³ B21D *22/10*

U.S. Cl. 72—57 **8 Claims**

1. In a die for the formation of semi-closed channels or other complex configurations in workpieces which includes relatively movable male and female die members and wherein said male die member includes a mandrel, the improvements comprising, an elastically deformable matrix included in said female die member, said matrix having a surface comprising a generally open forming groove formed therein and configured to receive said mandrel whereby, a workpiece may be disposed between said male and female die members and the same relatively moved to drive said mandrel and the relevant portion of said workpiece into said forming groove to deform said matrix and substantially close said forming groove around said mandrel to essential wrap said workpiece portion around said mandrel and form said configuration therein, whereupon said male and female die members may be relatively moved to remove said mandrel from said forming groove with attendant return of the matrix to its undeformed condition and re-opening of said forming groove to enable removal of said work-

piece portion therefrom, said matrix being generally wedge-shaped, and said forming groove being formed in the wider



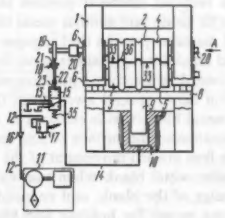
surface of the matrix which tapers away to either side of said forming groove.

4,295,353

MILL STAND FOR FORMING DISCONTINUOUS LONGITUDINAL DEFORMATIONS IN SHEET METAL

Vyacheslav I. Anisimov, ulitsa Metallurgov, 11, kv. 16, Magnitogorsk; Evgeny G. Bulgakov, ulitsa Vrachebnaya, 23, kv. 37; Vasily N. Gurin, ulitsa Lyapidevskogo, 16, both of Kramatorsk; Leonid V. Radjukevich, ulitsa 23 Avgusta, 47, kv. 42; Igor S. Trishevsky, ulitsa Dzerzhinskogo, 34, kv. 7, both of Kharkov; Oleg I. Trishevsky, ulitsa Lunacharskogo 8, kv. 20, Kramatorsk; Grigory R. Kheifets, ulitsa Bairona, 154a, kv. 114, Kharkov, and Anatoly B. Jurchenko, ulitsa Tukhachevskogo, 22, korpus 2, kv. 253, Moscow, all of U.S.S.R.

Filed Sep. 24, 1979, Ser. No. 78,238
Int. Cl.³ B21D *13/04*
U.S. Cl. 72—180 **5 Claims**



1. A mill stand for forming discontinuous longitudinal deformations on continuous sheet metal uninterruptedly fed to said mill stand, comprising:

a frame member;

forming rolls, having congruent circumferential forming elements, mounted on said frame member in such a way that one of the forming rolls is adapted for movement toward and away from said other forming rolls;

a power cylinder being connected with said forming roll adapted for movement;

a system for feeding a working medium to said power cylinder including means for controlling said power cylinder; and

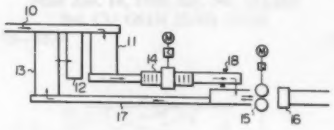
a master device operatively connected with one of said forming rolls and interacting with said means for controlling said power cylinder for periodically bringing together said forming rolls, thereby discontinuously forming longitudinal deformations on said sheet metal of generally any length without the need to change said forming rolls.

4,295,354

METHOD FOR PRODUCING BEAM BLANK FOR LARGE SIZE H-BEAM FROM FLAT SLAB

Koichi Itoh, Ichikawa; Osamu Koshida, and Katsuichi Nakayama, both of Ibaraki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Aug. 29, 1979, Ser. No. 70,831
Claims priority, application Japan, May 8, 1979, 54/56073
Int. Cl.³ B21B *1//12*
U.S. Cl. 72—225 **3 Claims**



1. A method for producing a beam blank for a large size H-beam from a flat slab, comprising the steps of:

positioning a large size flat slab with the width dimension vertical and rolling the vertically spaced edges a plurality of times in a two-high rolling mill to form a preformed beam blank, the shaping rolls of the two-high rolling mill having a roll profile with a groove-shaped recess therein having a depth b a width c at the bottom thereof and width d at the opening thereof, with dimensions of:

$$t \leqq c \leqq 1.2t$$

$$d = M + M'$$

$$b = f + f'$$

t is the thickness of the flat slab

M is the width of the flange of the beam blank to be formed

M′ is a dimension of from 15 to 35 mm

f is the thickness of the flange of the beam blank to be formed; and

f′ is a dimension from 20 to 40 mm; and

positioning said preformed beam blank with the width dimension thereof horizontal and further rolling the preformed blank by plurality of passes through a universal roughing mill into a beam blank of the desired shape, the rolling in the earlier passes through the universal roughing mill being with the rolls of the roughing mill position for making the reduction of the preformed beam blank by the horizontal rolls greater than the reduction by the vertical rolls thereof and the rolling in the later passes being with the rolls of said roughing mill positioned for making the reduction of the preformed beam blank by the horizontal rolls less than the reduction by the vertical rolls thereof.

4,295,355

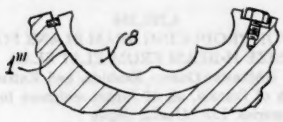
BEAM-BACKED STRIP MILL WITH ATTACHED INSERTS

Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn. 06720

Filed Aug. 13, 1979, Ser. No. 66,019
Int. Cl.³ B21B *13/14*
U.S. Cl. 72—242 **13 Claims**

1. In a multi-roll mill for rolling wide strips, a one-piece mill housing having a rigid beam facing each side of the strip, each beam having on its pressure side an arcuate section machined around the roll bite as an axis, an insert snugly seated in each of said arcuate sections, each of said inserts having arcuate channels machined on its inner surface parallel to said axis, roll-backing elements seated in said channels, each of said inserts being interchangeable in order to change the roll configuration

of the mill, each of said inserts being axially divided into segments, each segment having at least one of said channels



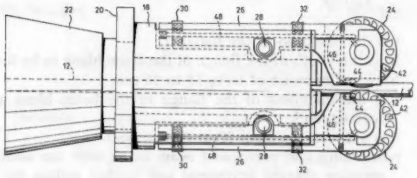
therein, each segment being individually fastened to its respective one of said arcuate beam sections by means operable from the front side of said mill for withdrawal and replacement.

4,295,356

ROLLER ENTRY GUIDES FOR ROD MILLS

Mario Fabris, 8 Roberts Rd., Grimsby, Ontario, Canada (L3M 3X2)

Filed Oct. 1, 1979, Ser. No. 80,820
Int. Cl.³ B21B *39/16*
U.S. Cl. 72—250 **4 Claims**



1. A roller entry guide for a rod mill comprising:

a body providing a rod passage therein through which the rod passes;

a pair of longitudinally extending rocker arm members mounted by the body on opposite sides of the rod passage for pivoting rocking movement about respective parallel pivot axes;

a pair of guide roller members each mounted by the respective rocker arm member for rotation about a respective rotation axis, the pivoting rocking movement of the arm members permitting movement of the guide roller members toward and away from one another;

each guide roller member having, in a peripheral portion, a ring of fluid reaction members coaxial with its axis of rotation;

nozzle means carried by each arm member external thereto and communicating with the passage means and disposed to direct a stream of fluid at the said ring of fluid reaction members substantially tangentially thereto to rotate the respective guide roller member about its axis of rotation; and

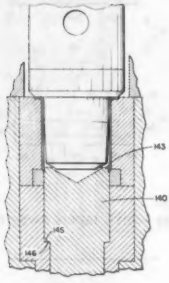
means for feeding fluid to the said nozzle means through said passage means whereby the guide roller members can be rotated at about their operative speeds prior to engagement by a rod passing through the device.

4,295,357

APPARATUS FOR MAKING METAL OUTERS AND INNERS

Ralph E. Roper, Indianapolis, Ind., assignor to General Tire & Rubber Co.

Continuation of Ser. No. 937,278, Aug. 28, 1978, Pat. No. 4,238,949, and a continuation-in-part of Ser. No. 691,720, Jun. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 622,269, Oct. 14, 1975. This application May 19, 1980, Ser. No. 150,776
Int. Cl.³ B21D *45/00*
U.S. Cl. 72—344 **13 Claims**



1. Apparatus for forming an annular sheet metal blank into an annular member of precise tolerances which comprises:

(a) an external die having a continuous die surface of the configuration desired for the external surface of said annular member, at least one portion of said continuous die surface being of smaller diameter than said annular metal blank so as to be capable of shrinking said blank to said smaller diameter when said blank is forced through said die, and said die having an annular ridge surrounding the inside of the die for seating one end of said annular metal blank,

(b) a first punch mounted with relation to said external die for the reciprocal travel through a path into and out of an endmost position within said external die, said first punch having a reduced diameter portion shaped and proportioned to fit inside said annular metal blank and having an enlarged diameter portion that engages said blank so as to force said blank through said external die when said punch travels toward said endmost position, said reduced diameter portion being spaced away from the portion of said annular metal blank that is reduced to a smaller diameter by the continuous die surface of said external die so as to allow the free inward movement of the internal surface of said annular metal blank when said external die reduces the diameter of the blank, said reduced diameter portion also having means for holding said blank on said punch when said reduced diameter portion and blank are located outside of said external die, and

(c) means for reciprocating said first punch axially through said path into and out of said endmost position in said external die.

4,295,358

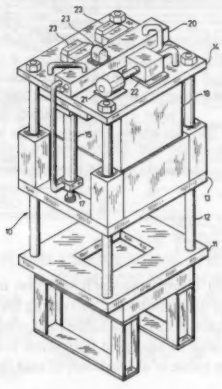
HYDRAULIC PRESS

J. Stewart Bulmer, 755 Fernhill Blvd., Oshawa, Ontario, Canada (L1J 5K2)

Filed Oct. 16, 1979, Ser. No. 85,241
Int. Cl.³ B21J *9/12*
U.S. Cl. 72—453.06 **7 Claims**

1. A hydraulic trim press comprising a horizontal rectangular bed; four tie rods extending vertically upwardly from each corner of said bed; a movable rectangular platen parallel to said bed and slidably mounted on said tie rods to move towards

and away from said bed; a stationary rectangular platen parallel to said bed and connected to the end of said tie rods distal from said bed; two spaced apart hydraulic cylinders secured to said stationary platen and extending vertically downward, said cylinders located between the end tie rods with piston rods



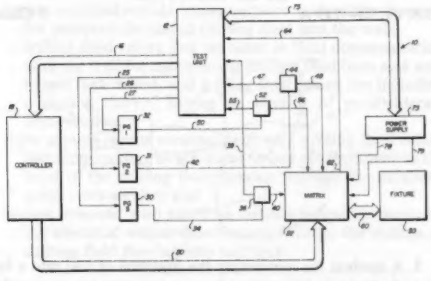
extending outwardly from each of said cylinders and connected to said movable platen, a hydraulic tank for storage of hydraulic fluid attached to the underside of said stationary platen, a means for driving said cylinders, a manifold secured on top of said stationary platen to direct hydraulic fluid to the control valves and cylinders.

4,295,359

CALIBRATION APPARATUS FOR CML CIRCUIT TEST UNIT

Dennis C. Hilker, Cave Creek, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Mar. 17, 1980, Ser. No. 131,294
Int. Cl.[3] G04F *7/00*; G01R *31/02*
U.S. Cl. 73—5 **8 Claims**



1. Apparatus for calibrating CML integrated circuit test unit comprising:

a. fixture capable of receiving a CML integrated circuit therein and including a plurality of pins, each pin capable of contact with one pad of said circuit when said circuit is mounted on said fixture;

b. a pulse generator producing a shaped pulse upon actuation;

c. a power splitter connected to receive said shaped pulse for transferring said shaped pulse to outputs thereof;

d. a matrix of electrically actuated relays connected to one output of said power splitter and to each pin of said fixture, said matrix adapted to connect said shaped pulse to a preselected pin; said matrix adapted to connect a predetermined pin to a waveform output of said matrix;

e. a controller connected to said relays for providing a switching signal to each relay of said matrix, said test unit connected to another output of said power splitter and waveforms from said waveform output; and

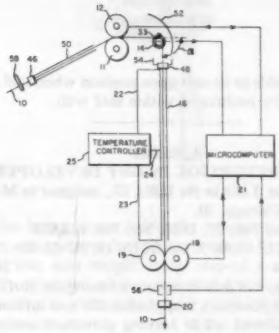
f. a shorting device selectively connectable between said predetermined pin and said preselected pin.

4,295,360

TENSION MEASURING APPARATUS

Frank S. Fountain, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 14, 1980, Ser. No. 111,665
Int. Cl.[3] G01N *25/00, 33/36*
U.S. Cl. 73—15.6 **2 Claims**



1. In an apparatus for measuring yarn tension while the yarn is being drawn that includes means for feeding the yarn from a source through a heater to a drawing means, a yarn direction-changing tension-measuring device located between the feed means and the heater comprising: a shaft having a plug attached to one end and a direction-changing guide mounted at its other end around which yarn passes, said shaft being of rectangular cross section with wide flat surfaces several times greater than its narrower surfaces to allow for flexure in response to forces generated during change of yarn direction about said guide, a strain transducer connected to opposite wide flat surfaces of said shaft and means for mounting said plug for limited rotation to detect only forces perpendicular to said wide flat surfaces.

4,295,361

DRILL PIPE TESTER WITH AUTOMATIC FILL-UP

Michael E. McMahan, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

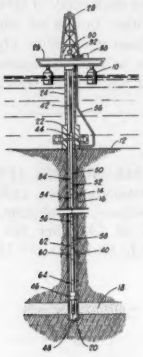
Filed Apr. 3, 1980, Ser. No. 136,830
Int. Cl.[3] G01M *3/08*
U.S. Cl. 73—40.5 R **19 Claims**

1. A pipe tester valve, comprising:

spherical closure valve means having a valve bore therethrough and being rotatable between an open and a closed position for opening and closing an interior of a string of pipe; and

automatic means for automatically closing said spherical closure valve means when said string of pipe is statically positioned within a well so that said string of pipe may be pressure tested, and for automatically opening said spherical closure valve means and allowing well fluid within said well to fill said string of pipe above said closure valve

means as said string of pipe and closure valve means are lowered into said well, said spherical closure valve means



being rotatable to its said open position when said string of pipe is finally positioned within said well.

4,295,362

PENTAERYTHRITOL IN DRY DEVELOPERS

Michael L. White, Lake in the Hills, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

Filed Feb. 22, 1980, Ser. No. 123,683
Int. Cl.[3] C09K *3/00*; G01N *19/08, 33/00*
U.S. Cl. 73—104 **14 Claims**

1. In the method of non-destructive testing for surface flaws in which a liquid penetrant is applied to the test surface, excess penetrant is removed while leaving penetrant entrapped in surface flaws and a dry developer powder is applied over the test surface to aid in drawing the entrapped penetrant to the surface and thereby render the location of said flaws visible, the improvement which comprises:

employing as said developer powder a dry composition including at least 35% by weight pentaerythritol powder at least 90% of said powder being less than 20 microns in diameter.

9. A dry developer composition for use in the penetrant inspection method for locating surface flaws in a workpiece, said developer consisting essentially of a mixture of at least 35% by weight pentaerythritol having a particle size such that at least 90% of the particles are less than 20 microns in dimension and a finely divided inert powder with a bulk density lower than pentaerythritol.

4,295,363

APPARATUS FOR DIAGNOSING FAULTS IN INDIVIDUAL CYLINDERS IN AN INTERNAL COMBUSTION ENGINE

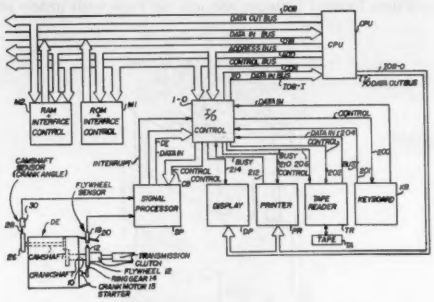
Gordon K. Buck, Greenlawn, and Cynthia H. Kozin, Huntington, both of N.Y., assignors to Harris Corporation, Cleveland, Ohio

Filed Mar. 25, 1977, Ser. No. 781,313
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—117.3 **19 Claims**

1. Apparatus for determining malfunctions of individual cylinders of an internal combustion engine, comprising:

means for measuring the values of the time intervals between successive crankshaft positions as the crankshaft of a said engine rotates through at least one engine cycle, wherein one engine cycle includes a number of power periods corresponding with the number of cylinders of the engine being tested and wherein each power period includes a plurality of said crankshaft positions;

first means for comparing for each power period the values of selected said time intervals associated with selected said crankshaft positions in the associated power period and providing for each cylinder a first indication having a value in accordance therewith; and,



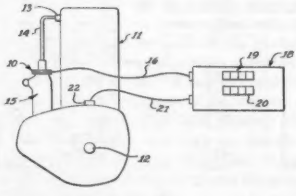
second means for comparing each said first indication with said other first indications and providing for each cylinder a second indication having a value in accordance with the ratio of the value of said first indication for that cylinder to the average value of at least two of said first indications.

4,295,364

TRANSDUCER DEVICE FOR MONITORING OF FUEL INJECTION

Joseph L. Dooley, Chicago, and Daniel J. Dooley, Burr Ridge, both of Ill., assignors to Creative Tool Company, Burr Ridge, Ill.

Filed Sep. 7, 1979, Ser. No. 73,251
Int. Cl.[3] G01M *19/00*
U.S. Cl. 73—119 A **7 Claims**



7. A method for monitoring the injection of fuel into a fuel line of a fuel injection system from an injection pump assembly including a delivery valve assembly of the type wherein the fuel is forced past a spring-valve element into a delivery chamber which has a cross-sectional area substantially larger than that of an outlet passage therefrom, said delivery valve assembly including a thick-walled section having a polygonal shape with a plurality of flat surfaces for facilitating installation of said delivery valve assembly, said method comprising: providing a transducer including a piezoelectric plate element and clamping said plate element against one of said flat surfaces to produce a short-duration electrical output pulse in response to each injection operation of said pump assembly, and monitoring electrical output pulses developed by said transducer means.

4,295,365
NMR ANALYSIS OF SUBTERRANEAN RESERVOIR SAMPLES IMMERSED IN LIQUID HALOCARBONS

Indurani D. Meshri, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 26, 1979, Ser. No. 15,267
Int. Cl.³ E21B 49/02
U.S. Cl. 73—153 5 Claims

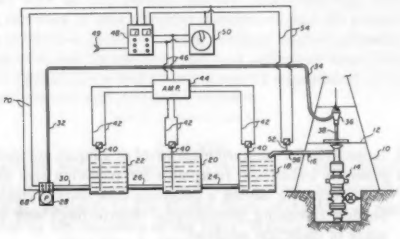
1. In a method of analyzing a sample of a subterranean reservoir with a nuclear magnetic resonance means, wherein said sample is saturated with an aqueous liquid and thereafter analyzed with said nuclear magnetic resonance means, wherein the improvement comprises:

immediately after saturating said sample, immersing it in a liquid halocarbon having no hydrogen atoms bound thereto and analyzing said sample immersed in said liquid halocarbon.

4,295,366
DRILLING FLUID CIRCULATING AND MONITORING SYSTEM AND METHOD

Joseph T. Gibson, and Gerald L. Duhon, both of New Iberia, La., assignors to A. C. Company, New Iberia, La.

Filed May 29, 1979, Ser. No. 42,969
Int. Cl.³ E21B 47/04
U.S. Cl. 73—155 15 Claims



1. A drilling fluid circulating system, comprising:

tank means for storing a quantity of drilling fluid used in a well;

means mounted in fluid communication with said tank means for pumping the stored drilling fluid into the well;

a drilling fluid return line mounted in fluid communication with the well for transporting drilling fluid from said well to said tank means, said drilling fluid return line including a section thereof having an interior of parallelogram cross-section;

flow sensing means mounted with said drilling fluid return line for providing an electrical output proportionate to the level of the drilling fluid flowing through the parallelogram cross-section; and

means mounted with said flow sensing means for receiving the electrical output therefrom to indicate the volume of drilling fluid flowing into said tank.

4,295,367
SPEED INDICATING DEVICE

Wayne B. Leslie, 12347 E. Bates Cir., Aurora, Colo. 80014

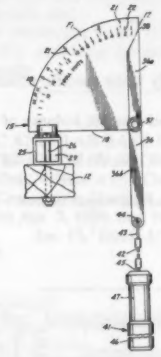
Filed Jan. 21, 1980, Ser. No. 113,622
Int. Cl.³ G01C 21/10
U.S. Cl. 73—184 20 Claims

1. A speed indicating device for a boat and like craft moving in a body of water comprising:

a plate with speed indicia for indicating the speed of the boat and having a first pivot joint portion at the front of said plate;

a mounting arm that extends laterally out from a side of the boat having a second pivot joint portion operatively associated with said first pivot joint portion for supporting said plate for pivotal movement about a generally vertical pivot to permit the plate to aline with the course of travel of the boat; and

a combination pointing arm, flexible line, and weight supported at a rear bottom portion of said plate, said pointing arm being pivotally mounted intermediate its ends to pivot relative to said plate about a generally horizontal pivot at the rear of the plate with a pointing end moving along said speed indicia to indicate speed,

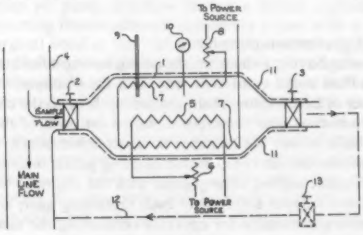


said line being connected to the lower end of said pointing arm and said weight being connected to the lower end of said line, said weight being adapted to move through a body of water while suspended from said pointing arm whereby to pivot said pointing arm about said generally horizontal pivot in relation to the speed of the boat, said plate also being moved about said generally vertical pivot to seek out a direction to aline the plate with the course of travel of the boat as said weight is dragged via the body of water.

4,295,368
METHOD FOR MEASURING THE FULL RANGE IN QUALITY OF A VAPOR

Joseph Jannone, 133-48 84th St., Ozone Park, New York, N.Y. 11417

Filed Aug. 22, 1979, Ser. No. 68,686
Int. Cl.³ G01K 17/00
U.S. Cl. 73—192 1 Claim



1. A method for determining the quality of a fluid vapor comprising the steps of (1) providing a source of fluid vapor, (2) directing a portion of said fluid vapor through an open insulated sampling chamber at substantially the same pressure and temperature as the fluid vapor in said source, (3) sealing said chamber to seal a representative portion of fluid vapor therein, (4) applying heat to said representative portion of fluid vapor to change the state of said representative portion of fluid

vapor to a superheated or liquid condition, (5) cooling said representative portion of fluid vapor to establish a cooling mode for said superheated vapor or liquid wherein the temperatures and pressures during said cooling mode are recorded, (6) utilizing the temperature and pressure readings during said cooling mode while in the superheated state to determine the specific volume of the fluid vapor source; and (7) thereafter determining the quality of said fluid vapor source by the following equation:

$$V_a = V_b = V_f + X(V_g - V_f)$$

wherein

V_a and V_b individually is the specific volume of the representative portion;

V_g is the dry saturated specific volume of the fluid vapor source;

V_f is the wet saturated specific volume of the fluid vapor source; and

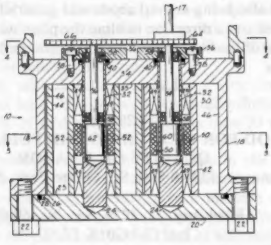
X is the quality of the fluid vapor source.

4,295,369

DUAL MAGNETIC DRIVE FOR GEAR METERS

Fred E. Wendelboe, Erie, Pa., assignor to Geosource Inc., Houston, Tex.

Filed Apr. 10, 1980, Ser. No. 138,985
Int. Cl.³ G01F *3/08*
U.S. Cl. 73—261 **23 Claims**



1. A gear meter, comprising:

a casing having a chamber, the casing having a fluid inlet and a fluid outlet communicating with the chamber;

a pair of fixed hollow shafts extending through the chamber;

a measuring gear rotatably mounted on each of the fixed shafts within the chamber so as to continuously engage one another and so as each measuring gear is in continuous dynamic sealing arrangement with the chamber walls;

a driver magnet arranged in each measuring gear; and

a drive transmission for operably connecting the measuring gears to a meter accessory wherein the drive transmission comprises:

rotatable shafts arranged inside the fixed, hollow shafts and extending beyond the measuring chamber;

driven magnets fixed to the rotatable shafts such that the rotation of the measuring gears and driver magnets urges the rotation of the driven magnets and rotatable shafts; and

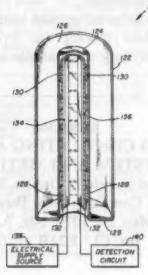
a coupling gear mounted to each of the rotatable shafts outside the measuring chamber, said coupling gears being adapted for connection to a meter accessory.

4,295,370

CAPACITIVE SCHEME FOR MEASURING THE LEVEL OF A LIQUID

Robert G. Bristol, Everett, Mass., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 19,653, Mar. 12, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,819
Int. Cl.³ G01F *23/26*
U.S. Cl. 73—304 C **1 Claim**



1. Apparatus for measuring the level of a liquid comprising:

a generally cylindrical receptacle for receiving said liquid, said receptacle having a generally concentric cylindrical portion extending substantially therethrough and being made of dielectric material;

a plurality of electrodes located within said cylindrical portion and against said dielectric material, each of said electrodes being situated at a different vertical level for said liquid in said receptacle;

a drive electrode means located within said cylindrical portion for capacitively coupling an electrical signal to said plurality of electrodes;

a layer of insulation mounted between said drive electrode means and each of said electrodes of said plurality of electrodes for forming signal transmitting capacitance therebetween;

an electrical supply means connected to said drive electrode means for supplying said electrical signal thereto;

means for capacitively shunting said electrical signal through said dielectric portion of said receptacle and any liquid in said receptacle and away from said plurality of electrodes, the amount of signal shunted being dependent upon the amount of said liquid in said receptacle;

detection electrode means mounted adjacent said plurality of electrodes and separated therefrom by said layer of insulation for capacitively receiving said electrical signal from said plurality of electrodes; and

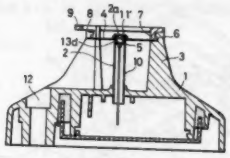
a single measuring circuit means connected to said detection electrode means for measuring the amount of signal transmitted to said circuit means from all of said plurality of electrodes, said amount of signal transmitted to said circuit means being responsive to said amount of signal shunted by said means for capacitively shunting and thereby being responsive to the amount of said liquid in said receptacle, said measuring circuit means thereby being adapted for measuring the amount of said liquid in said receptacle.

4,295,371

TEMPERATURE DETECTING DEVICE

Hiroshi Sawa, Yokohama, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 139,524
Claims priority, application Japan, Jun. 22, 1979, 54-85583[U]
Int. Cl.³ G01K 7/00
U.S. Cl. 73—359 A 9 Claims



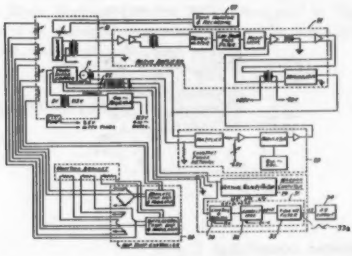
1. A temperature detecting device comprising: casing means, said casing means being provided with a plurality of rib portions each having a receiving shoulder formed on an inside portion thereof; a protective tube formed of a material having a high thermal conductivity and being mounted upon said casing means centrally of said rib portions; heat detecting means disposed within said protective tube and in thermal contact with an end portion thereof; heat collecting means being received in said shoulder portions of said rib portions; and a protective member having portions thereof adapted to engage with said rib portions, said heat collecting means being fixedly supported on said casing means by engagement of said rib portions and said protective member.

4,295,372

GRAVITY MEASUREMENT APPARATUS FOR SHIPS

John De Matteo, Whitestone, and Frank Villani, Brooklyn, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1968, Ser. No. 781,488
Int. Cl.² G01M 1/12
U.S. Cl. 73—382 G 4 Claims



1. An apparatus for continually measuring the free-air gravity anomaly from a moving vehicle which comprises:

vertical acceleration measuring means carried by said vehicle and having a digital rate pulse output proportional to the instantaneous total vertical acceleration sensed by said measuring means,

a scaler/counter having an input and output terminal and providing an output which is scaled to a selected factor and which output is a count of the input pulses,

first electrical means connecting the output of said measuring means to the said input terminal of said scaler/counter means,

a correction circuit having a pair of inputs and an output, one of its inputs connected to receive the output of said scaler/counter means, the output of said correction being the sum of the input signals,

a Mardan navigational computer including a vertical velocity routine for providing an output which is the negative of the theoretical gravity and the Coriolis error,

second electrical means connecting the output of said computer to said other input of said correction circuit, a time averaging means having negligible weighting at the beginning and end of the period relative to the center time,

said averaging means connected to receive the output of said correction means, and

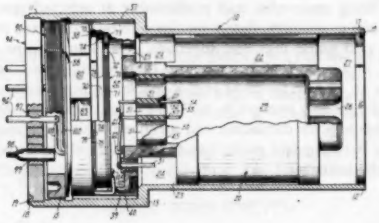
readout means connected to the output of said averaging means, thereby providing an indication of the free-air gravity anomaly.

4,295,373

FLUIDIC ANGULAR RATE SENSOR WITH INTEGRATED IMPULSE JET PUMP ASSEMBLY

E. Marston Moffatt, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 3, 1980, Ser. No. 137,109
Int. Cl.³ G01P 3/26
U.S. Cl. 73—505 7 Claims



1. An angular rate sensor, having:

a sealed, fluid filled casing for housing a nozzle block assembly having a jet chamber disposed therein, and for housing a jet pump assembly in registration with said jet chamber and connected for response to an external source of AC signals, said jet chamber including a nozzle and sensing elements disposed at opposite ends thereof, said sensing elements being cooled differentially in dependence on the angular rotation of the sensor, by a fluid jet formed by fluid forced under pressure through said nozzle by said pump assembly at a constant rate of flow provided by the improvement, comprising:

a unitary jet pump structure having a hollow cylindrical supporting flexure element cohesively joined with a metallurgical bond at one end to the periphery of a deformable piezoelectric diaphragm and cohesively joined with a metallurgical bond at the other end to a major surface of an anvil support means, said anvil means major surface providing the end wall of a pump chamber defined otherwise by the internal diameter of the cylindrical flexure and the diaphragm bonded to the other end thereof, said anvil support means being adapted to rigidly engage the casing internally for supporting said pump unitary structure in registration with said jet chamber within said casing.

4,295,374

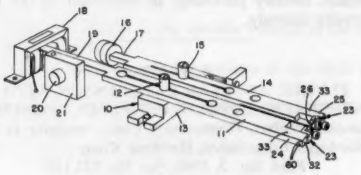
SPECIMEN GRIPS FOR DYNAMIC MECHANICAL ANALYZER

Robert P. Kusy, Chapel Hill, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 10, 1979, Ser. No. 74,092
Int. Cl.³ G01N 3/32
U.S. Cl. 73—579 4 Claims

1. In a dynamic mechanical analyzer to support a specimen for testing, said analyzer having a pair of spaced sample arms

displaceable relative to each other and having terminal freely extending spaced-apart ends, one of said sample arms being driven and the other counterbalanced, said driven arm having an electromechanical transducer, and means to determine the frequency and amplitude of oscillation of said driven arm, the improvement comprising; a pair of clamps for releasably supporting a specimen to be tested and said clamps and specimen being retained by said sample arms adjacent to the terminal spaced-apart ends thereof, each clamp having a body member, said body member having a base section, said base section having a pair of laterally spaced-apart projecting and cooperat-



ing guide lugs, said guide lugs having a specimen stop means for prepositioning a specimen to be tested, said specimen stop means being removable and positionable at selected spaced increments to accommodate a specimen to be centralized relative to said guide lugs and specimen positioning means for testing, means on said base section for mounting said body member to an arm terminal end, a specimen means cooperatively and slidably retained by said guide lugs, means on one of said guide lugs for displacing said specimen positioning means laterally between said guide lugs to releasably clamp a specimen to be tested.

4,295,375

ULTRASONIC METHOD OF TESTING WELDED JOINTS

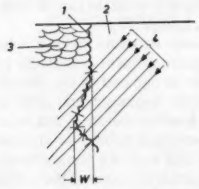
Otto Ganglbauer; Felix Wallner, both of Linz; Helmut Scheidl, Ried; Hermann Reindl, Linz, all of Austria, and Rainer Frielinghaus, Bornheim-Merten, Fed. Rep. of Germany, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria and Krautkraemer GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 106,865

Claims priority, application Austria, Jan. 8, 1979, 115/79

Int. Cl.[3] G01N *29/04*

U.S. Cl. 73—582 **6 Claims**



1. A method of testing a welded joint comprising base metal and a weld bonded to said base metal at an interface, said method comprising the steps of causing an ultrasonic sound beam to be incident on said interface at an oblique angle to said joint, receiving echoes generated by reflectors in said joint in response to said beam, and deriving information regarding the size and nature of such reflectors from the amplitude of said echoes,

the improvement residing in that the frequency of said sound beam is below an upper frequency limit at which sound has in said base material a wavelength which equals the largest peak-to-valley distance of said interface in any area thereof on which said sound beam is incident at a time.

4,295,376

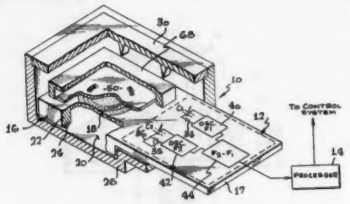
FORCE RESPONSIVE TRANSDUCER

Robert L. Bell, Chatsworth, Calif., assignor to Besco Industries, Inc., Chatsworth, Calif.

Filed Dec. 1, 1978, Ser. No. 965,604

Int. Cl.[3] G01L *9/12*

U.S. Cl. 73—724 **42 Claims**



1. A force responsive capacitive transducer comprising:

a flexible diaphragm having a face region deflectable in response to a deflecting force acting thereon and including first electrode means comprising electrically separate electrodes in at least two different regions on the deflectable face region thereof that are deflected differently in response to a deflecting force;

and movable plate means coupled to the deflectable face region of said diaphragm between the separate electrodes of said first electrode means and including second electrode means facing the first electrode means.

4,295,377

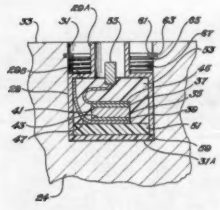
FASTENER INCORPORATING REMOVABLE ULTRASONIC TRANSDUCER

James C. Couchman, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Jul. 12, 1979, Ser. No. 57,057

Int. Cl.[3] F16B *31/02;* **G01N** *29/00*

U.S. Cl. 73—761 **21 Claims**



1. A fastener, comprising:

a shank having a head at one end and threads formed at the other end,

an acoustic transducer located in a container means and affixed therein such that said transducer and said container means are an integral unit, and

attaching means for removably attaching said container means to one end of said fastener with said acoustic transducer being acoustically coupled to said fastener to allow pulse-echo measurements to be obtained while said fastener is torqued in place with a wrench means,

said attaching means being separate from the wrench means whereby when the wrench means is removed from said fastener, said container means remains attached to said fastener,

the entire portion of said fastener between said container

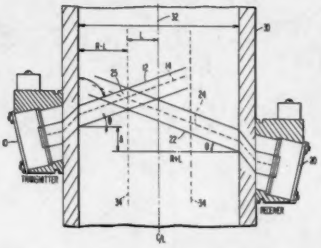
means and the end of said fastener opposite said container means being of solid metal throughout.

4,295,378

METHOD AND APPARATUS FOR FLOW MEASUREMENT USING DOPPLER FREQUENCY SHIFT

Tom L. Erb, and Wendell D. Miller, both of Austin, Tex., assignors to Ramsey Engineering Company, St. Paul, Minn.

Filed Feb. 11, 1980, Ser. No. 120,189
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.25 **12 Claims**



1. The method of measurement of the average velocity of media flowing in a conduit by the use of Doppler frequency shift comprising the steps of:

(a) determining the locus of points within said conduit where the incremental media flow rate is equal to the average flow rate of the media in said conduit;

(b) directing a transmitting transducer beam central axis to an intersecting point on said locus of points;

(c) directing a receiving transducer beam central axis at said intersecting point on said locus of points;

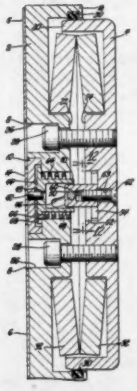
(d) measuring the incremental rate of flow at said intersecting point on said locus by the use of Doppler frequency shift flow measurement.

4,295,379

GAGE TO MEASURE TRACK TENSION

Boris Zura, Sterling Heights, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1980, Ser. No. 118,136
Int. Cl.³ G01L *1/04*
U.S. Cl. 73—862.62 **8 Claims**



1. A gage to measure the tension in the track of a track laying vehicle comprising:

a. a compressible spring,

b. a housing for said spring having telescoping inside and outside housing covers and a central axis,

c. the covers having aligned cavities along said axis,

d. means, including cam and cam follower elements, in the cavities to convert relative translatory movement of one element along said axis into angular movement of the remaining element about said axis,

e. a radially disposed indicator arm secured to the angularly movable element,

f. means to secure the two covers against relative angular movement while permitting relative telescoping of the covers along said axis, and

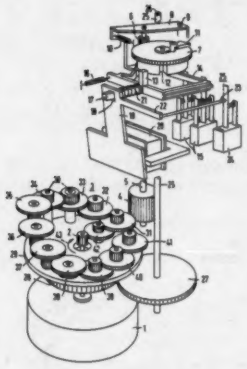
g. additional spring means to oppose said angular movement.

4,295,380

GEARING FOR A MOTOR DRIVEN TIMING RELAY

Alois Mühling, Pleinfeld; Frank Reissner, and Helmut Schmidt, both of Nuremberg all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 25, 1978, Ser. No. 936,946
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740743
Int. Cl.² F16H *5/74, 3/34*
U.S. Cl. 74—3.5 **5 Claims**



5. Gearing for a motor driven, multiple range timing relay including:

a turntable having a motor driven shaft mounted coaxially therewith,

a coupling pinion adjacent to the turntable;

a chain of cascaded gear pairs having a first gear pair and at least one more driven gear pair rotatably carried on posts which are fastened by one end to the turntable, being parallel to the motor driven shaft, only every second gear pair positioned on the turntable for engagement with the coupling pinion,

a pinion on the drive shaft engaging the first of the gear pairs, and

a drive for indexing the turntable so as to engage any one of the driven second gear pairs with the coupling pinion, whereby the timing range of the relay is set.

4,295,381

CRANKLESS RECIPROCATING ENGINE AND GYROSCOPIC POWER TRANSMISSION SYSTEM

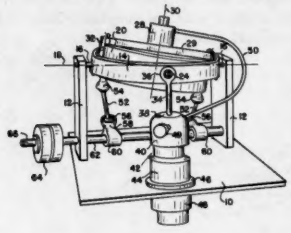
Virgil A. Hinds, 1950 Miller Ave., Ann Arbor, Mich. 48103

Continuation-in-part of Ser. No. 785,943, Apr. 8, 1977, Pat. No. 4,161,889. This application Feb. 16, 1979, Ser. No. 12,841

The portion of the term of this patent subsequent to Jul. 24, 1996, has been disclaimed.

Int. Cl.[3] **F16H** *29/02, 33/10;* **G01C** *19/00*

U.S. Cl. 74—5 R **7 Claims**



1. A crankless reciprocating engine and power transmission system comprising means for supporting and substantially linearly guiding an oscillating member of said engine, a mass rotating about a first axis, said rotating mass being in a frame pivotably supported by a gimbal about a second axis at right angle to said first axis, pivot means pivotably supporting said gimbal about a third axis at right angle to said second axis and at variable angle relative to said first axis, means coupling said engine oscillating member to a point of said gimbal for oscillating said gimbal and said rotating mass frame about said third axis, power output means reciprocable by said rotating mass frame when precessionally oscillating about said second axis and biasing means urging said first axis to a position wherein said first axis is orthogonal to said third axis.

4,295,382

IRREGULAR-MOTION MECHANISM

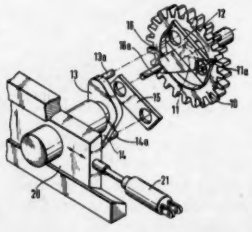
Bernd Lollert, and Heinrich Risse, both of Düsseldorf, Fed. Rep. of Germany, assignors to Jagenberg-Werke AG, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 23, 1979, Ser. No. 69,150

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1978, 2836451

Int. Cl.[3] **F16H** *21/48, 21/18*

U.S. Cl. 74—68 **1 Claim**



1. In an irregular-motion mechanism comprising two series-connected double cranks each comprising a driving link and a driven link connected thereto by a connecting rod, the driving link of the first double crank and the driven link of the second double crank being mounted for independent rotation about a common axis, the driven link of the first double crank being rigidly joined to the driving link of the second double crank, the improvement wherein the driven link of the first double crank forms an obtuse angle of between 120° and 160° with the driving link of the second double crank and the ratio of their lengths is about 2:3, the length-ratio range for the driving link of the first double crank to the driven link of the second double crank is about 3:2 to 5:4, and the length ratio for the connecting rods of the first and second double cranks is about 1:1.

4,295,383

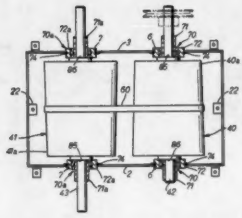
VARIABLE SPEED DRIVE

John W. Frost, De Pere, Wis., assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 11, 1977, Ser. No. 850,607

Int. Cl.[3] **F16H** *7/08;* **F16G** *5/16*

U.S. Cl. 474—83 **5 Claims**



1. A variable speed transmission having a pair of tapered rollers arranged in parallelism and each having a smaller end, the smaller end of said roller as being oppositely disposed from one another, said rollers having a central shaft extending from either end thereof, anti-friction bearing assemblies mounted on each of said shafts and adjacent the rollers thereon, a casing for enclosing said rollers and including a lower half having a pair of generally vertical side walls, one on either end of said rollers, said side walls having semi-circular openings therein for the reception of the said bearing assemblies mounted on said shaft, an endless belt trained around said rollers for providing driving connection therebetween, the spacing of the semi-circular openings in each side wall being such that when the bearing assemblies are mounted in said openings, said belt is tensioned to a predetermined magnitude, said belt including a chrome leather driving face which is bonded to a combination nylon and polyester plastic.

4,295,384

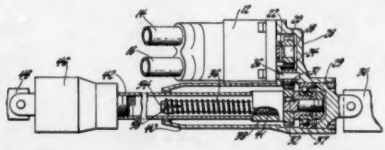
BALL NUT AND SCREW ASSEMBLY WITH TRAVEL LIMIT STOP

Howard C. Brandt, Saginaw, and Leonard R. Grabowski, Bay City, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 13, 1979, Ser. No. 74,960

Int. Cl.[3] **F16H** *1/08, 27/02, 29/20*

U.S. Cl. 74—424.8 NA **6 Claims**



1. In a ball screw assembly, the combination of an elongated screw having helical ball groove means therein, a ball nut member operatively mounted for movement relative to said screw having helical ball groove means therein which matches the groove means of said screw and cooperates therewith to form a helical ball track, a train of balls operatively mounted in said track to drivingly interconnect said nut member and said

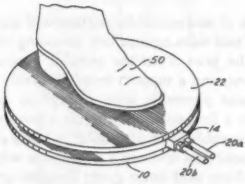
screw, ball return means supported by said ball nut member for circulating said balls between opposite end turns of said track, and fixed radially extending stop means disposed in a predetermined position on said screw to provide outwardly inclined ramp means for acting on said balls of said train to progressively force said balls outwardly and radially against the inner surface of said ball nut member forming a portion of said ball groove means therein as said ball nut member progressively moves onto said ramp means to thereby place said ball nut member in hoop stress to prevent said ball nut from traveling past said stop means and thereby provide a limit stop for said assembly.

4,295,385

PIVOTED LEVER ACTUATOR

George H. Huttenhow, 4630 Fillmore St., Denver, Colo. 80216

Filed Jan. 21, 1980, Ser. No. 114,056
Int. Cl.³ G05G *9/02, 1/14;* F16C *1/12*
U.S. Cl. 74—478 **5 Claims**



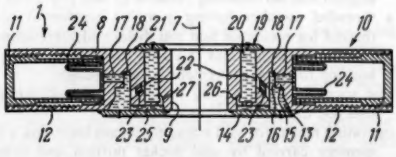
1. Pivotable control means for a cable actuator comprising:
(a) circular base plate means for resting on a surface without attachment;
(b) circular rotatable top plate means with a planar top surface mounted for free rotation on and in close proximity said base plate means;
(c) circular cable support ring means depending from and rotatable with said top plate means positioned between said bottom and top plate means, and said ring means being slightly smaller than said top plate means including a cable support groove;
(d) cable guide means mounted on said base plate means for passing a cable onto and from said cable support ring means, providing two free cable ends beyond said unit; and
(e) guide roller means mounted adjacent said cable guide means for simultaneously guiding two stretches of a cable through said cable guide means and onto said support ring means.

4,295,386

APPARATUS FOR BALANCING BODIES OF REVOLUTION

Jury G. Zhivotov, ulitsa Svobody, 4, kv. 148, Dnepropetrovsk, U.S.S.R.

Filed Mar. 12, 1979, Ser. No. 19,935
Int. Cl.³ F16F *15/22*
U.S. Cl. 74—573 F **2 Claims**



1. An apparatus for balancing a body of revolution with a vertical axis of rotation, comprising: a plurality of balancing tanks located peripherally within said body of revolution;

a distributing chamber, having an annular shoulder, mounted coaxially with said body of revolution, and hydraulically connected with said balancing tanks; conduits of said distributing chamber, made in the annular shoulder of said distributing chamber and hydraulically connecting said distributing chamber with said balancing tanks; one of the ends of said conduits being located inside said distributing chamber and equidistant from said axis of rotation of said body of revolution; and the other of said ends of said conduits being located inside said balancing tanks;

resilient diaphragms fixed on walls of said balancing tanks at the other ends or outlets of said conduits;

a balancing liquid supply source hydraulically associated with said distributing chamber; a chamber of said liquid supply source, having a diameter smaller than the diameter of said distributing chamber and located centrally within said body of revolution; and

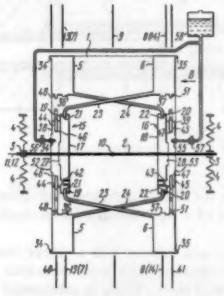
said chamber of the liquid supply source, the distributing chamber and part of said balancing tanks defined by said resilient diaphragm, and forming a fluid tight cavity.

4,295,387

APPARATUS FOR BALANCING BODIES OF REVOLUTION

Jury G. Zhivotov, ulitsa Svobody, 4, kv. 148; Igor I. Kupchinsky, ulitsa Kuibysheva, 4, kv. 3; Vyacheslav D. Plokhuta, ulitsa Dzerzhinskogo, 33-a, kv. 7; Alexandr M. Bezverkhny, ulitsa Titova, 30, kv. 76, all of Dnepropetrovsk, U.S.S.R.; Samoil I. Nabutovsky, deceased, late of Dnepropetrovsk, U.S.S.R., and by Elena D. Eroshevskaya, administrator, ulitsa Lenina, 1a, kv. 51, Dnepropetrovsk, U.S.S.R.

Filed Jul. 12, 1979, Ser. No. 56,925
Int. Cl.³ F16F *15/22*
U.S. Cl. 74—573 F **3 Claims**



1. An apparatus for balancing bodies of revolution secured on a shaft, said bodies of revolution having an axis of rotation, a geometric axis and a center of mass, comprising:

a liquid supply source;

distributing units mounted coaxially with the body of revolution in measurement planes on both sides of a plane passing through said center of mass of said body of revolution perpendicular to the geometric axis of said body of revolution, a first chamber of each of the distributing units being installed in a first measurement plane and being hydraulically connected with said liquid supply source, conduits of said first chamber of each of the distributing units being provided in a side surface of said first chamber, and ends of said conduits being located inside said first chamber and equidistant from the geometric axis of said body of revolution;

balancing tanks mounted peripherally within said body of revolution in correction planes on both sides of the plane

passing through said center of mass of said body of revolution perpendicular to said geometric axis of said body of revolution, and hydraulically associated with said distributing units,

each conduit of said first chamber of each of said distributing units being hydraulically associated with respective balancing tanks which are located in the correction plane to the other side of the respective measurement plane containing said distributing unit relative to the plane passing through said center of mass of said body of revolution perpendicular to said geometric axis of said body of revolution,

each of said balancing tanks and said conduit, hydraulically associated therewith, of each of said distributing units being arranged in planes passing through said geometric axis of said body of revolution to form an angle within the range of 0° to 90°, defined by the plane containing said conduit hydraulically associated with said balancing tank, and said angle coinciding in direction with the sense of rotation of said body of revolution; and

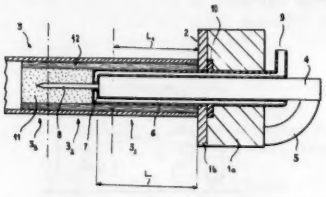
pipelines connecting said liquid supply source with said conduits of the first chamber of said distributing units, and connecting said first chambers of said distributing units with said balancing tanks.

4,295,388

CONTROL ROD AND A PROCESS FOR FITTING A CONNECTING MEMBER AT ONE END OF A CONTROL ROD

Jacques Mialon, Vitrolles, and Bernard Lamarche, Velaux, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 26, 1979, Ser. No. 97,338
Claims priority, application France, Dec. 4, 1978, 78 34111
Int. Cl.³ G05G *1/00*
U.S. Cl. 74—579 R **7 Claims**



1. A process for fitting a connecting member at a tubular deformable end of a light weight metal shaft, comprising the steps of:

inserting into said tubular end a sleeve formed of resistant fibers impregnated with polymerizable resin, the outer surface of said sleeve being in substantial contact with the inner wall of said end;

flattening a portion of said end sufficiently to bring opposite inner walls of said sleeve into substantial contact with each other; and

polymerizing said resin to seal the interior of said rod against entry of air or other gas.

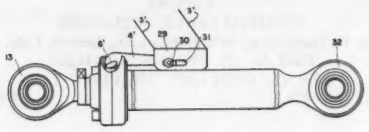
4,295,389

ADJUSTABLE LENGTH UPPER GUIDE MEMBER

Hubert Geisthoff, Lohmar, and Wilhelm von Allwörden, Erbach, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 779,615, Mar. 21, 1977, Pat. No. 4,126,057. This application Nov. 20, 1978, Ser. No. 962,476
Int. Cl.³ B60D *7/00*
U.S. Cl. 74—586 **4 Claims**

1. An adjustable length upper guide member for a hitch attachment of a tractor comprising an outer tubular guide element and an inner relatively displaceable guide element telescopingly positioned therein, said inner guide element having annular grooves on its outer surface, a housing on said outer guide element, a pair of jaws pivotally mounted within said housing to define first and second arms on each jaw, the first arms of said jaw being engageable with the annular grooves on said inner guide element, said second arms defining actuating cams facing each other, and a first lever having a longer end extending outwardly of said housing and one end extending into said housing and an eccentric portion of said one end with two sides within said housing, one of said sides engageable against the inner surface of said housing and the other of said sides engageable with the actuating cams of said jaws such that when the longer end of the first lever is pivoted



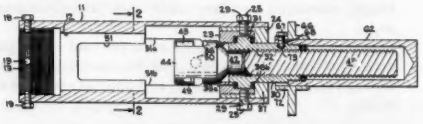
said one side of said eccentric portion will apply a force urging the other of said sides against said actuating cams of the jaws to disengage the jaws from the annular grooves on said inner guide element, and a support lever pivotably mounted on said first lever and pivotable with respect to said outer tubular member into a first position wherein a portion of said support lever is engageable with said outer tubular guide member for supporting said first lever in a position in which said jaws are disengaged from said inner guide element grooves and into a second position in which said jaws are engaged with said inner guide element, and means connected to said support lever for pivoting said support lever between said first and second positions.

4,295,390

MANUAL OVERRIDE CONTROL FOR DOUBLE-ACTING ACTUATOR

Ervin A. Buchta, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.

Filed Oct. 19, 1979, Ser. No. 86,966
Int. Cl.³ F16H *1/18*; F16K *31/00*
U.S. Cl. 74—625 **8 Claims**



5. A manual override control for selectively operating a double-acting actuator, said actuator having an actuator housing and an actuator rod with a distal end projecting from said actuator housing comprising:

laterally directed connector means on said rod distal end;

a control housing having an internal passage and a laterally directed aperture;

means for detachably connecting said control housing to said actuator housing to dispose said passage in axially aligned and surrounding relation to said rod distal end;

a threaded member having a socket portion at one end thereof for receiving said rod distal end therewithin;

means for mounting said threaded member to said control housing for axial movement in said passage;

said socket portion having means for releasably engaging said rod distal end connector means;

operating means for said engaging means including a handle member carried by said socket portion and extending laterally through said control housing aperture;

means for mounting said threaded member and said socket

portion in said control housing to facilitate removing said override control from said actuator as a single unit, said actuator being operable with said override control removed; and,

means for moving said threaded member in said passage to selectively move said actuator rod relative to said actuator housing when said socket portion has said rod distal end received therein and engaged therewith upon operation of said laterally directed handle member.

4,295,391

TRANSMISSION ASSEMBLY

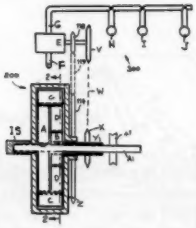
Arthur Philpott, Little Eaton, and Reginald S. Fuher, Alvaston, both of England, assignors to Ready Pen Limited, Derby, England

Filed May 29, 1979, Ser. No. 43,234

Claims priority, application United Kingdom, May 30, 1978, 24160/78

Int. Cl.³ F16H *3/00, 57/10*

U.S. Cl. 74—782 **11 Claims**



1. A transmission assembly comprising an input shaft, an output shaft in co-axial alignment with the input shaft, a drive sprocket wheel carrying member secured to the input shaft and extending generally radially therefrom, a first sprocket wheel co-axially mounted on the output shaft, a second sprocket wheel rotatably mounted on the output shaft, at least one drive sprocket wheel assembly rotatably mounted on the sprocket wheel carrying member, each drive sprocket where assembly including at least a primary and secondary sprocket wheel, and for each drive sprocket wheel assembly, a chain extending about the primary sprocket wheel and the first sprocket wheel and a further chain extending about the secondary sprocket wheel and the second sprocket wheel, and control means for controlling the speed of the rotation of the second sprocket wheel to control the speed of rotation of the output shaft, and reversal drive means providing a step up driving connection between the input shaft and said second sprocket wheel via a clutch, so that when said clutch is activated the second sprocket wheel is rotated faster than the input shaft to effect reversal of the output shaft.

4,295,392

CORKED BOTTLE OPENER

Wallace C. Peck, 227 Grove St., Norwell, Mass. 02061

Filed Jun. 22, 1979, Ser. No. 50,991

Int. Cl.³ B67B *7/04, 7/36*

U.S. Cl. 81—3.32 **4 Claims**

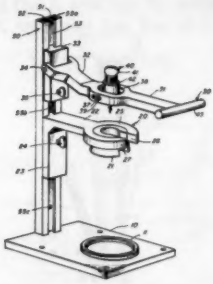
1. A corked bottle opener (according to claim 1 wherein said cork removing means comprises) comprising

a base section,

a bracket support means, said bracket support means being in a substantially 90° relationship with said base section,

retaining means contiguous with said bracket support means and positioned above said base section so that a bottle is positioned and retained onto said base section,

a first bracket portion having a key portion configured to engage said bracket support means, said first bracket portion having means to pivotally engage a second and a third bracket portion, said second bracket portion is integral with said third bracket portion and are in an angular relationship to one another, said third bracket portion confronts said retaining means and further comprises a corkscrew mechanism means pivotally and longitudinally movably mounted to the third bracket portion at a position confronting a slotted cylindrical opening in said retaining means and adapted to engage said cork in the bottle whereby upward movement of said second and third bracket portions pivotally about said first bracket causes the corkscrew mechanism means inserted in said cork to lift the cork out of the bottle.



4,295,393

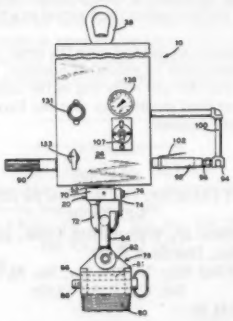
STUD HANDLING TOOL

Marty E. Adcock, Logan, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 25, 1980, Ser. No. 115,519

Int. Cl.³ B25B *29/00*

U.S. Cl. 81—57.4 **9 Claims**



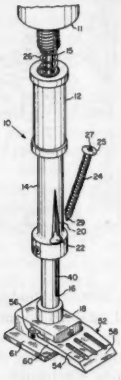
1. An apparatus for threadingly engaging a first threaded member with a second threaded receiving member and disengaging it therefrom, comprising a frame, means extending from said frame for suspending said first threaded member above said second threaded receiving member, a rotary air motor attached to said frame, engagement means attached to the output of said rotary air motor for engaging said first threaded member for rotation by said rotary air motor, and means attached to said frame operable to apply a lifting force to said first threaded member while said first threaded member is rotated by said air motor and in threaded engagement with said second threaded receiving member, said lifting force applying means comprising a linear air motor operably attached to said frame, and said means extending from said frame being defined by an extensible output member of said linear air motor.

4,295,394

INSTALLATION TOOL BARREL ASSEMBLY

Charles J. DeCaro, Pittsburgh, Pa., assignor to Textron Inc., Providence, R.I.

Filed Feb. 25, 1980, Ser. No. 124,524
Int. Cl.³ B25B *23/02*
U.S. Cl. 81—57.37 **8 Claims**



1. A barrel assembly suitable for connection to a fastener driver tool having a tool body and a driver comprising:

A. an outer sleeve adapted for attachment at one end to the tool body;

B. an inner sleeve mounted to the outer sleeve so as to be retractable therein, said inner sleeve including an annular wall, a bore and an elongated slot in the wall, said slot increasing in depth from a starting point and terminating in an enlarged clear through opening in registry with the bore to accommodate a fastener head;

C. a barrel retractably connected at a first end to the inner sleeve and including a clear through notch in alignment with said slot to receive the fastener in a bore of the barrel; and

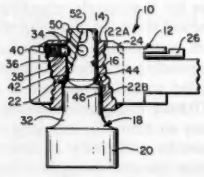
D. biasing means associated with the inner sleeve and barrel to urge them into an extended position, the driver being positioned at the tool body end of the clear through notch in said extended position so that the barrel assembly can receive said fastener.

4,295,395

TOOL ATTACHMENT HAVING SPRING EJECT RELEASE

Vincent A. Stifano, Jr., Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed May 7, 1979, Ser. No. 36,797
Int. Cl.³ B25B *13/06*
U.S. Cl. 81—121 R **10 Claims**



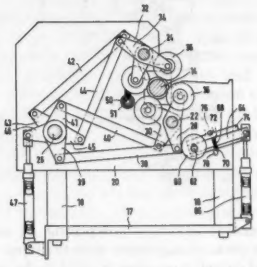
1. A tool comprising a body having a drive member with a non-circular opening therein, and a releasable tool attachment having a fastener driving element and connected shank, the shank being dimensioned and configured to be inserted into the opening into an operating position in driving engagement with the drive member, one of the drive and shank members having a camming surface, the other of the drive and shank members having resiliently biased ejection means engageable with the camming surface upon discrete movement of the shank from its operating position relative to the drive member in a tool attachment release direction, the ejection means and the camming surface cooperating upon engagement to apply an axial driving force to the attachment for positively ejecting the attachment from the tool body.

4,295,396

BAR FEEDING MECHANISM FOR MACHINES FOR WORKING ROTATING BAR STOCK

Heinz Hasslauer, Uhingen, Fed. Rep. of Germany, assignor to Hermann Traub GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 933,954, Aug. 15, 1978, abandoned. This application Apr. 22, 1980, Ser. No. 142,669
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737957
Int. Cl.³ B23B *3/00, 13/00, 25/00*
U.S. Cl. 82—1 C **7 Claims**



1. A method of guiding a rotating bar stock in a machine for working said bar stock, said bar stock having a middle portion and a tail portion, comprising the steps of:

(a) contacting said rotating bar stock with pressure engagement by rollers in a plurality of roller assemblies, said roller assemblies being adapted to support and center said bar stock for feeding to said machine;

(b) feeding said rotating bar stock for working by said machine;

(c) limiting the contact of said rollers of at least one roller assembly engaging said middle portion of said rotating bar stock to allow sufficient play for a radial antinode of rotation; and

(d) readjusting the contact of said rollers of at least one roller assembly after the middle portion has passed to allow pressure engagement of said tail portion of said rotating bar stock.

4,295,397

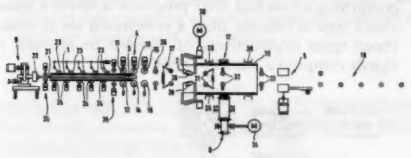
APPARATUS FOR PEELING PIPES

Wilhelm Schweer, Leichlingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Filed Feb. 7, 1979, Ser. No. 10,177
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805947
Int. Cl.³ B23B *5/12*
U.S. Cl. 82—20 **7 Claims**

1. Apparatus for peeling pipes comprising: internal and external independent rotatably driven cutter heads for peeling a pipe, said cutter heads being positioned sufficiently close together for simultaneous peeling of a pipe over at least a portion of the pipe length, feed means for non-rotatably longitudinally feeding a pipe past said cutter heads, and said internal cutter head being in the form of a drill head secured to one end

of an elongated drill rod which extends through the pipe and along which the pipe is fed by said feed means including inde-



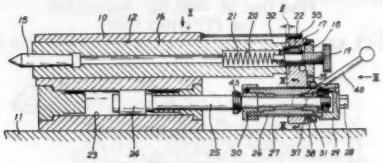
pendent variable speed drive means for each said cutter head for independently driving each said cutter head at a desired speed.

4,295,398

WORKPIECE SUPPORTING DEVICE

Yoshiaki Sugata, and Kiyoshi Miyagawa, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 21, 1980, Ser. No. 132,426
Claims priority, application Japan, Mar. 22, 1979, 54-37377
Int. Cl.³ B23B *23/00*
U.S. Cl. 82—31 **5 Claims**



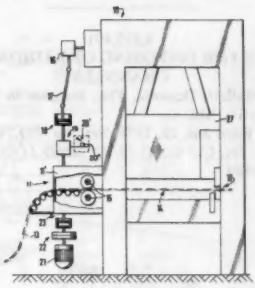
1. A workpiece supporting device comprising:
a housing;
a holding shaft slidably received in said housing;
a center member carried on one end of said holding shaft and adapted to support one end of said workpiece;
a hydraulic cylinder formed in said housing and including a piston slidably received in said housing and a piston rod integrally formed with said piston and extending from said housing in parallel relationship with the axis of said holding shaft;
a sleeve member rotatably but non-slidably mounted on said piston rod and formed with a threaded portion at the periphery thereof;
means for rotating said sleeve member;
a connecting member threadedly engaged with said threaded portion of said sleeve member;
an adjusting member threadedly engaged with said connecting member in coaxial relationship with said holding shaft;
spring means interposed between said holding shaft and said adjusting member for applying a holding force to said workpiece being supported on said center member; and
means arranged between said holding shaft and said connecting member for limiting relative axial movement therebetween within a predetermined distance.

4,295,399

APPARATUS FOR INTERMITTENT FEEDING OF WEB-TYPE OR STRIP-TYPE MATERIAL

Kurt Finsterwalder; Karl-Heinz Philipp, both of Göppingen; Günter Riedisser, Eislingen, and Wilfried Voss, Göppingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Oct. 6, 1978, Ser. No. 949,232
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744960
Int. Cl.³ B26D *5/22*
U.S. Cl. 83—251 **6 Claims**



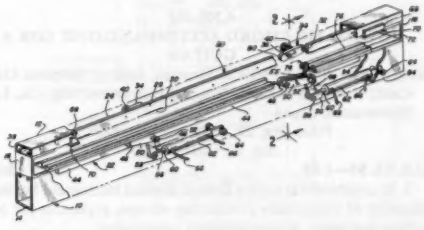
1. An apparatus for intermittently feeding a web-type or strip-type material to an operating chamber of a press having a main press drive means and a scrap cutter means driven in correspondence with an operating cycle of the press, the apparatus including feed roller means, feed gear means operatively connected with the feed roller means, and means for connecting the feed gear means with the main press drive means so that the feed roller means may be driven by said main press drive means, characterized in that means are provided for selectively interrupting the driving of said feed roller means by said main press drive, an auxiliary drive means is operatively connected with the feed gear means so as to drive the same when the drive is interrupted by said interrupting means, and in that a further drive means is operatively connected with the scrap cutter for driving the scrap cutter independently of the main press drive in correspondence with a cycle of the feed gear means.

4,295,400

WEB SEVERING DEVICE

Clifford L. Larson, Marco Island, Fla., assignor to Baldwin-Korthe Web Controls, Inc., Addison, Ill.

Filed Mar. 31, 1980, Ser. No. 135,772
Int. Cl.³ B26D *7/22*
U.S. Cl. 83—545 **11 Claims**



1. A web severing device for a printing press or the like comprising, in combination, a pair of generally parallel spaced-apart elongated carriages positioned transverse to the direction of travel of the web and straddling the path of the web so that

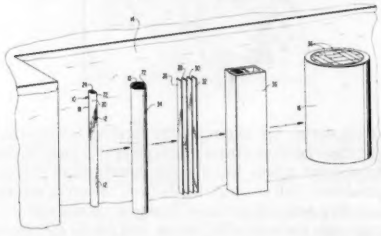
the web passes between said pair of carriages, a severing blade attached to a first carriage of said pair of carriages, a first means for moving the second carriage of said pair of carriages in a direction toward said first carriage to narrow the spaced-apart distance between said carriages, a second means responsive to further movement of said second carriage toward said first carriage for moving said first carriage in the opposite direction toward said second carriage to bring said blade into severing contact with said web, and means for preventing effective activation of said responsive means during any period of time in which a relatively non-flexible, rigid object is disposed between said carriages.

4,295,401

APPARATUS FOR DISPOSING OF RADIOACTIVE FUEL CHANNELS

William L. Mullett, Dunedin, Fla., assignor to NUS Corporation, Rockville, Md.

Filed Jul. 29, 1976, Ser. No. 709,745
Int. Cl.[3] G21C *19/32*; B26D *11/00*
U.S. Cl. 83—864 **5 Claims**



1. Apparatus for disposing of a radioactive rectangular tubular fuel channel comprising elongated housing means for containing therein the tubular channel, and cutter means, mounted on said housing means, for cutting the channel along each longitudinal corner thereof until the channel is severed into four side plates; wherein said cutter means comprises four roller cutter blades respectively engaging the four longitudinal corners of the tubular channel, and motive means on said housing for simultaneously longitudinally moving said cutter blades in a reciprocating motion along the four longitudinal corners of the tubular channel, whereby severance is achieved by material displacement, as opposed to material removal, so that no material chips are produced; said apparatus further comprising guide roller means associated with each cutter blade to maintain alignment of the cutter blade on the corresponding longitudinal corner during the cutting operation, and to maintain the rectangular configuration of the channel after one or more plates are severed.

4,295,402

AUTOMATIC CHORD ACCOMPANIMENT FOR A GUITAR

Ralph Deutsch, and Leslie J. Deutsch, both of Sherman Oaks, Calif., assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

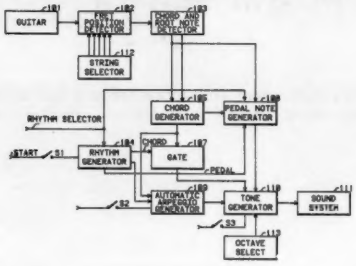
Filed Oct. 29, 1979, Ser. No. 88,978
Int. Cl.[3] G10F *1/00*
U.S. Cl. 84—1.03 **22 Claims**

1. In combination with a fretted musical instrument having a plurality of electrically conducting strings, apparatus for providing automatic accompaniment comprising;

a means for generating fret signals corresponding to members of said plurality of electrically conducting strings pressed into contact with frets on said fretted musical instrument,

a string selection means for selecting said fret signals corresponding to a preselected subset of said plurality of electrically conducting strings,

a chord detect means responsive to said selected fret signals comprising a matched filter processor wherein a musical chord type is selected from a preselected set of musical chord types irrespectively of whether or not said fret signals comprise a musical chord type,



a root note detect means responsive to said selected fret signals for selecting a chord root note corresponding to said selected musical chord type,

a note data generator means responsive to said selected musical chord type and said selected chord root note wherein input note data is generated, and

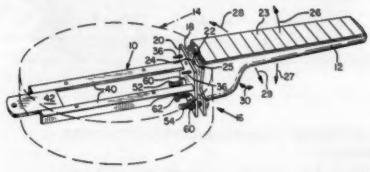
a tone generator for creating musical tones at pitches responsive to said input note data.

4,295,403

ADJUSTABLE NECK ATTACHMENT FOR STRINGED INSTRUMENTS

Jeff B. Harris, 10275 SW. Century Oak Dr., Tigard, Oreg. 97223

Filed Dec. 24, 1980, Ser. No. 220,080
Int. Cl.[3] G10D *3/00*
U.S. Cl. 84—293 **9 Claims**



1. In a stringed musical instrument having a body, an elongate neck extending therefrom, and at least one string extending along said body and said neck, an adjustable neck attachment device for connecting said neck to said body, comprising:

(a) a neck adapter plate and means for attaching said neck adapter plate to said neck;

(b) a body adapter plate and means for attaching said body adapter plate to said body;

(c) single point pivot means associated with said neck adapter plate and said body adapter plate for permitting angular adjustment of the position of said neck adapter plate with respect to said body adapter plate about said single point pivot means;

(d) angle adjustment means extending between said body adapter plate and said neck adapter plate for adjusting the angular position of said neck with respect to said body by rotating said body and neck adapter plates with respect to one another about an axis extending through said pivot means and generally perpendicular to the length of said neck; and

(e) rotational adjustment means associated with said angle

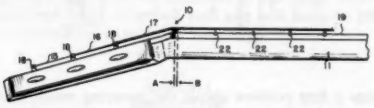
adjustment means, for adjustably holding said neck in a selected position of rotation with respect to said body, about an axis extending generally along the length of said neck and through said pivot means.

4,295,404

COMPENSATED NUT FOR A LUTE-TYPE INSTRUMENT

Paul R. Smith, Annapolis, Md., assignor to DiMarzio Musical Instrument Pickups, Inc., N.Y.

Filed Mar. 14, 1980, Ser. No. 130,574
Int. Cl.³ G10D *3/04*
U.S. Cl. 84—314 N **7 Claims**



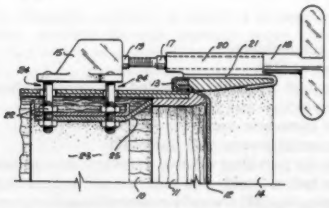
1. A nut for a lute-type instrument said nut comprising an elongated body, said body normally having a length to straddle the neck of said instrument, said body normally adapted to abut the fingerboard of said instrument, and said body including an extending portion, said extending portion adapted to extend over said fingerboard, said extended portion regularly graduated in extent increasing from the treble side to the bass side of said neck, said extent of a selected distance adapted to compensate for sharpness of notes played near said neck.

4,295,405

MUSICIAN'S DRUM

Donald E. Sleishman, 56A Bignell St., Illawong, New South Wales, 2234, Australia

Filed Oct. 9, 1979, Ser. No. 82,462
Claims priority, application Australia, Oct. 18, 1978, PD6446
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—413 **8 Claims**



1. A musician's drum of the kind comprising a cylindrical shell, a diaphragm, and loading means to stretch the diaphragm across one end of the shell, wherein said loading means comprise: engaging means gripping the periphery of the diaphragm; a stabilizer ring co-axial with the shell intermediate the ends of the shell and spaced from the shell; at least three abutment means spaced apart around, secured to and extending from said ring into abutment with said shell to prevent movement of said ring towards at least said one end of the shell; and a plurality of tensioning means extending from said engaging means to said ring.

4,295,406

NOTE TRANSLATION DEVICE

Larry C. Smith, 22916 Juniper Ave., Torrance, Calif. 90505

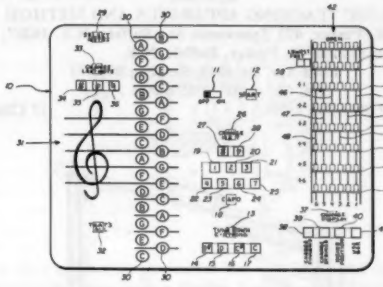
Filed Aug. 20, 1979, Ser. No. 68,063
Int. Cl.³ G09B *15/02*
U.S. Cl. 84—470 R **25 Claims**

1. A note translation device for translating selected note symbols shown in printed music to string and fingerboard location information to use for playing the notes on a stringed fingerboard instrument, comprising:

a support structure;

a keyboard switch array supported by said support structure and including a plurality of musical note switch means corresponding to a plurality of printed music note symbols and selectively operable to enable the operator to input selected note symbols shown in the printed music;

electronic processing circuitry means responsive to said musical note switch means for storing said selected note symbols that correspond to note symbols shown in the printed music,



said electronic processing circuit means further adapted for choosing string and fingerboard location information for playing said selected note symbols thereby translating the note symbols shown in the printed music into string and fingerboard locations to use for playing the notes of a stringed fingerboard instrument, and

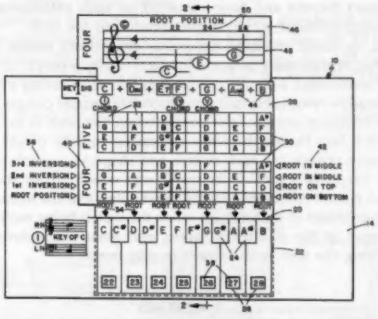
means for communicating to the operator said string and fingerboard location information selected by said electronic processing circuit means whereby the string number and fingerboard location is identified for playing each selected note symbol on said stringed fingerboard instrument.

4,295,407

KEYBOARD SIMULATION WITH VERTICAL INVERSION INDEXES

Verna M. Leonard, 3848 E. Swift, Fresno, Calif. 93726

Filed Apr. 18, 1980, Ser. No. 141,577
Int. Cl.³ G10G *1/02*
U.S. Cl. 84—471 R **6 Claims**



1. A musical teaching aid comprising:

(a) a base member having a backing panel and a front panel, side panels being seamed together across the top and bottom and said front panel defining a horizontal slit;

(b) a simulated keyboard displayed on said front panel beneath said slit;

(c) an insert card for insertion in said slit and having a plural-

ity of vertical rows of tone-naming indicia indexed above the keys in said keyboard;

(d) the tones in said tone-naming indicia beginning at the bottom tone thereof with the tone of the underlying key and progressing upwardly naming sequential tones in a particular chord; and

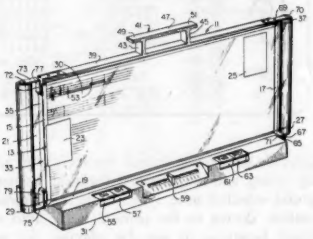
(e) indicia displayed on the front of said front panel naming the inversions of said particular chord and indexing with the tones on said insert card initiating the respective inversion.

4,295,408

MUSIC TEACHING APPARATUS AND METHOD

John W. Pasker, 472 Tonawanda St., Buffalo, N.Y. 14207, assignor to John W. Pasker, Buffalo, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,071
Int. Cl.[3] G04F *5/02*; G09B *15/04*
U.S. Cl. 84—484 **17 Claims**



1. A music teaching apparatus comprising means to hold music in position for viewing by a player of a musical instrument, a continuous transparent web having a plurality of indicia thereon for indicating notes of the music to be played when the web is in position with respect to the music and the player, said indicia being so positioned as to permit continuous reading and playing of the music by the player ahead of one thereof when the web and the indicia are moving with respect to the music, means for continuously moving the web with respect to the music, and J-shaped or U-shaped spring members, one each at the top and bottom respectively of the apparatus at an end thereof and at a side of the continuous web, for applying a spring force to the web to hold it in tension, which spring members each have horizontal extensions directed away from the main portion of the apparatus and longitudinally with respect thereto and have mounted on such extensions a non-driving cylinder which applies tension to the web.

2. A music teaching apparatus comprising means to hold music in stationary position for viewing by a player of a musical instrument, a continuous transparent web having a plurality of readily removable and repositionable opaque covers thereon for covering parts of the music when the web is in position with a face thereof between the music and the player, which opaque covers are each of size and shape so as each to cover the height of a staff of the music and which are so positioned as to permit continuous reading and playing of the music by the player ahead of such covers when the web is being moved with respect to the stationary music, and means for continuously moving the web with respect to said music.

4,295,409

SHOT AND POWDER DISPENSER ATTACHMENT

Frank H. Simpson, Rte. 2 Box 276, Cornelius, Oreg. 97113

Filed Apr. 20, 1979, Ser. No. 31,764
Int. Cl.[3] F42B *33/02*
U.S. Cl. 86—31 **2 Claims**

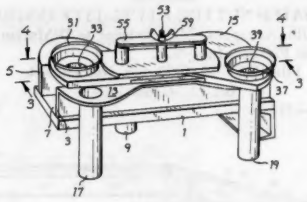
1. A shot and powder dispenser in combination with a cartridge reloading machine comprising:

a body defining a channel;

metering means movable within the channel;

lip means on the body, the lip means including a hollow chute;

a powder carrier on the body, the carrier optionally pivotable;



from a first position above the metering means to either a second position on the lip means, so that the flow of powder to the metering means is blocked, or to a third position on the lip means above the chute;

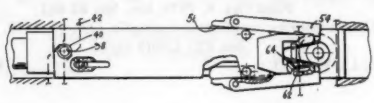
and a dispensing tube on the body operatively connected to the metering means and to the reloading machine.

4,295,410

GUN BOLT LOCKING SYSTEM

Raymond A. Patenaude, Burlington; Steven R. Duke, Williston, and Edward A. Proulx, Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Nov. 28, 1979, Ser. No. 97,993
Int. Cl.[3] F41D *7/04*
U.S. Cl. 89—12 **12 Claims**



1. A gun including:

a receiver [18];

a gun bolt assembly journaled for reciprocation along a longitudinal axis in said receiver;

a first transverse cam track [36];

a second transverse cam track [42];

means for providing relative transverse motion between said gun bolt assembly and said first and second cam tracks;

a locking lug [22] pivotally mounted to said receiver [18] and having a first cam following surface [51] and a second cam following surface [68];

said gun bolt assembly including:

a gun bolt body [10] having

a cam surface [50];

a face [56] for transmitting force along a longitudinal component;

a first cam follower [34] engaged with said first cam track [36], having a mode of operation such that relative transverse motion between said first cam track and said first cam follower provides reciprocation of said gun bolt body [10] relative to said receiver [18];

a slide [12] carried by and journaled for relative longitudinal reciprocation with respect to said gun bolt body [10] and having:

a cam surface [66];

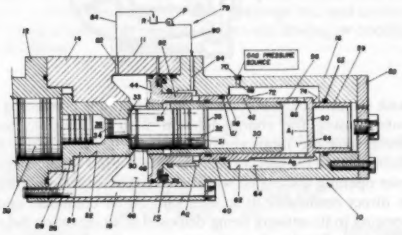
a second cam follower [40] engaged with said second cam track 1 [42], having a mode of operation such that relative motion between said second cam track and said second cam follower provides reciprocation of said slide [12] relative to said gun bolt body [10];

an actuator lug [44] pivotally mounted to said slide [12], having a mode of operation such that reciprocation of said slide progressively in a first direction [aft] relative to said body causes said actuator lug to be cammed progressively outwardly by such cam surface [50] of said gun bolt body and to engage said first cam following surface [51] of said locking lug [22] to pivot said locking lug progressively in a first direction to engage said gun bolt body to lock said gun bolt body against reciprocation in a first direction [aft], and that reciprocation of said slide in a second direction [forward] relative to said body causes said cam surface [66] of said slider to engage said second cam following surface [68] of said locking lug [22] to pivot said locking lug progressively in a second direction to disengage from said gun bolt body to unlock said gun bolt body to permit reciprocation in said first direction.

4,295,411
IMPACTOR

Innes Grantmyre, and Brent Miedema, both of Cambridge, Canada, assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Oct. 3, 1979, Ser. No. 81,519
Int. Cl.³ F01L *17/00, 25/04;* **F01B** *7/18*
U.S. Cl. 91—165 **14 Claims**



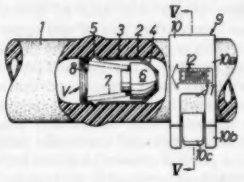
1. In an impactor assembly in which a hammer piston is reciprocably movable through alternate work strokes and return strokes within an elongated bore with the work strokes being effected by a closed drive system which continuously urges said hammer piston in one axial direction toward a rest position thereof by applying to said hammer piston a variable driving impetus of a magnitude dependent upon the displacement of said hammer piston from said rest position and the return strokes being effected by the selective supplying of hydraulic fluid flow from a fluid flow supply means into said bore to apply to said hammer piston a return impetus which displaces said hammer piston from said rest position by overcoming said variable driving impetus, and wherein a valve means includes a valve member which is selectively movable to a supply position to permit the supplying of hydraulic fluid flow into said bore to effect such a return stroke and subsequently is movable to an exhaust position to permit expulsion of hydraulic fluid from said bore thereby permitting said drive system to effect such a work stroke, the improvement comprising:

actuator means integral with said valve means and including surface means upon which said drive system and said hydraulic fluid flow from said fluid flow supply means continuously exert a bias to cycle said valve member between said supply and exhaust positions by providing variable valve actuating impetus to act on said valve member wherein said valve actuating impetus includes a first component resulting from the bias of said drive system on said surface means to urge said valve member toward said supply position, a second component resulting from the bias of said hydraulic fluid flow on said surface means to urge said valve member toward said supply position and a third component resulting from the bias of said drive system on said surface means to urge said valve member toward said exhaust position.

4,295,412
HOSE WITH A ONE-WAY VALVE FOR A VACUUM OPERATED SERVOMOTOR

Nobuaki Hachiro, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Dec. 12, 1979, Ser. No. 103,512
Claims priority, application Japan, Dec. 19, 1978, 53-158996
Int. Cl.³ F15B *13/04;* **F16K** *15/00*
U.S. Cl. 91—468 **1 Claim**

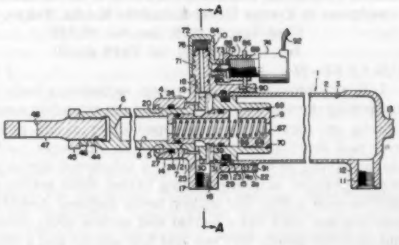


1. In a connection device for use with a vacuum operated servomotor comprising a flexible hose connected between a booster shell of said servomotor and an intake manifold of an internal combustion engine; a housing having a valve seat, a cylindrical guide portion, and an annular seal projection of a diameter larger than that of said cylindrical guide portion all disposed in an axial direction; a valve member disposed in said housing; and a valve spring in said housing for urging said valve member into eating engagement with said valve seat, said housing being urged into said hose and said cylindrical guide portion being closely fitted in the inner surface of said hose while said seal projection acts to expand said hose radially outwardly to form a tight seal therebetween; the improvement comprises said seal projection having a caulked portion formed at one end of said housing for holding therein an outer peripheral portion of a retainer for supporting a fixed end of said valve spring.

4,295,413
HYDRAULIC ACTUATOR

Toshio Kamimura, Gifu, Japan, assignor to Teijin Seiki Company, Limited, Osaka, Japan

Continuation of Ser. No. 4,534, Jan. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 807,233, Jun. 16, 1977, abandoned. This application Jun. 2, 1980, Ser. No. 155,743
Claims priority, application Japan, Jun. 18, 1976, 51-71966
Int. Cl.³ F01B *25/26*
U.S. Cl. 92—5 L **2 Claims**



1. A hydraulic actuator for aircrafts, comprising:

a cylinder;

a main piston axially slidably received in said cylinder and having a hollow bore axially extending therein;

a liquid source system for supplying a liquid to said cylinder to relatively slidably move said cylinder and piston;

at least one locking member radially movably retained in said main piston;

a ram axially slidably received in said hollow bore of said main piston and having a lower engaging portion slidably engageable with the radially inner face of said locking member, an upper engaging portion axially spaced apart from said lower engaging portion with a circumferential length longer than that of said lower engaging portion and slidably engageable with the radially inner face of said locking member, a stepped portion positioned between said lower and upper engaging portions with a circumferential length longer than that of said lower engaging portion but shorter than that of said upper engaging portion and slidably engageable with the radially inner face of said locking member, a first inclined portion connected at one end with said lower engaging portion and at the other end connected with one end of said stepped portion to be slidably engageable with the radially inner face of said locking member for radial movement thereof, and a second inclined portion connected at one end with the other end of said stepped portion and at the other end connected with said upper engaging portion to be slidably engageable with the radially inner face of said locking member for radial movement thereof;

a compression coil spring accommodated in said bore of said main piston to urge said ram toward said lower engaging portion from said upper engaging portion;

a switch piston radially slidably mounted on said cylinder to have a radially inner face engageable with the radially outer face of said locking member;

an indicator for indicating lock and unlock engagement conditions of said cylinder and said main piston; and

a detecting electric switch for detecting the radially moved position of said locking member through said switch piston to detect said main piston which is locked and unlocked and for transmitting lock and unlock signals to said indicator, whereby the radially inner face of said locking member is in engagement with said lower engaging portion of said ram to assume an unlock engagement position wherein said main piston is in unlocked relation with said cylinder, the radially inner face of said locking member is in engagement with said stepped portion of said ram to assume a first lock engagement position wherein said indicator indicates said unlock signal even though said cylinder and said main piston are in said first lock engagement condition, and the radially inner face of said locking member is in engagement with said upper engaging portion of said ram to assume a second lock engagement position wherein said indicator remains indicating said lock signal.

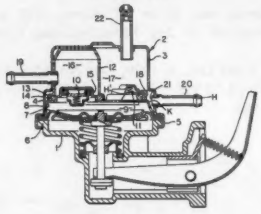
4,295,414

DIAPHRAGM-TYPE FUEL PUMP

Hiroshi Mochizuki, and Tokio Seki, both of Sowamachi, Japan, assignors to Kyosan Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 85,037
Int. Cl.[3] F15B *21/04*; F04B *45/10*
U.S. Cl. 92—98 **2 Claims**

1. In a diaphragm-type fuel pump, including a body having an opening therein, a pumping diaphragm extending across and closing said opening, a cup-shaped outer casing positioned over said diaphragm and connected to said body, said outer casing having an end wall spaced a substantial distance from said diaphragm, said outer casing having three axially-spaced sections with a first said section being disposed directly adjacent said end wall and a second said section being cylindrical and disposed axially between said first section and a third said section, said third section being cylindrical and defined at the mouth of said outer casing and connected to said body, said third section having a diameter greater than said second section, said second section having a cross-sectional area greater than said first section, a separator positioned within and extending diametrically across said outer casing, said separator being positioned axially between said end wall and said diaphragm and being spaced from said diaphragm to define a pumping chamber therebetween, said separator and said diaphragm having the peripheral edges thereof fixedly interposed between said body and said outer casing within said third cylindrical section, said separator having cylindrically projecting inlet and outlet valve holding sections formed thereon and projecting axially of said separator toward said end wall, inlet and outlet valve means respectively mounted within said inlet and outlet valve holding sections, and divider means disposed within the compartment defined within said outer casing between said end wall and said separator for dividing said compartment into inlet and outlet chambers which respectively communicate with the inlet and outlet valve means, a fuel inlet pipe projecting through the outer casing for communication



with the inlet chamber, and a fuel outlet pipe connected to the outer casing for communication with the outlet chamber, comprising the improvement wherein the fuel outlet pipe is connected to the second section of said outer casing and has an inlet opening associated with the end thereof which is disposed in direct communication with said outlet chamber, said inlet opening in its entirety being disposed at an elevation below the elevation of said outlet valve means so that the inlet opening is continuously immersed in its entirety within a reservoir of fuel which collects within said outlet chamber below the elevation of said outlet valve means, and a return pipe connected to said casing for direct communication with said outlet chamber for removing vapors from the upper portion of said outlet chamber, said return pipe having an inlet opening formed at the end thereof in direct communication with said outlet chamber at an elevation which is substantially higher than the elevation of said outlet valve means so that said last-mentioned inlet opening is not immersed in the fuel reservoir to permit continuous removal of vapors from said outlet chamber.

4,295,415

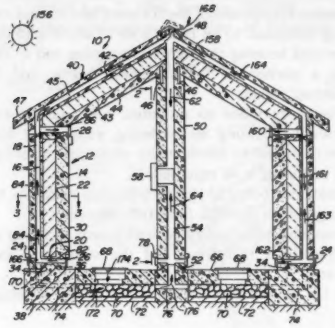
ENVIRONMENTALLY HEATED AND COOLED PRE-FABRICATED INSULATED CONCRETE BUILDING

Peter J. Schneider, Jr., R.D. #4, Boyertown, Pa. 19512

Filed Aug. 16, 1979, Ser. No. 67,090
Int. Cl.[3] F24F *7/00*
U.S. Cl. 98—31 **14 Claims**

1. A building wall construction comprising exterior wall units constructed of an inner and an outer wall forming a space therebetween with said inner and outer walls being joined by a connecting member along their lower ends, said inner and outer walls being composed of reinforced concrete, said inner and outer walls being provided with an interlocking shape along their lateral edges for interlocking with an adjacent wall unit; said wall unit being assemblable to form a wall having a continuous and substantially uniform space between said inner and outer walls for receiving and forming a continuous and substantially uniform layer of insulation; said outer walls being provided with air ducts therein providing an air passage path between a lower point and a higher point of said outer wall,

said air ducts being provided with a pair of controlled openings at its lower end for selectively communicating with the environment and the inside of the building formed by the building wall, control means for selectively placing the upper portion of

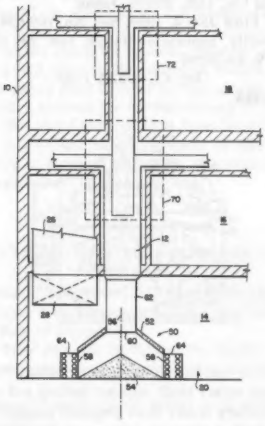


said ducts in communication with the environment and the inside of the building, said controlled openings and said control means being selectively openable to provide heating or cooling of the building.

4,295,416
AIR DISTRIBUTION SYSTEM

Dimiter Gorchev, Boston, Mass.; Karl U. Ingard, Kittery Point, Me., and Herbert L. Willke, Jr., Cambridge, Mass., assignors to Mitco Corporation, Somerville, Mass.

Filed Sep. 20, 1978, Ser. No. 944,134
Int. Cl.³ F24F *13/00*
U.S. Cl. 98—33 R **19 Claims**



1. An air distribution system comprising, in combination:

A. a mixing plenum including means for receiving outside and return air,

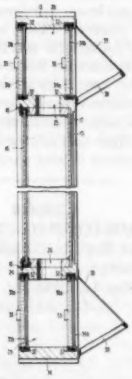
B. input flow concentrator and integral silencer disposed within said plenum, said concentrator and silencer including a concentrator input port coupled to said plenum and sidewalls establishing an airflow path from said concentrator input port to an output port, said airflow path being substantially symmetrical about an output axis, said sidewalls including inner and outer path defining surfaces lined with acoustically absorbent material, said inner and outer path defining surfaces defining a substantially radial airflow path adjacent to said plenum and a substantially axial airflow path at said output port, said inner path defining surface being substantially symmetrical about said output axis and extending along said output axis substantially across said concentrator input port, wherein said concentrator and silencer include inner and outer sections coaxial with said airflow axis, said outer section being hollow and having an inner surface and said inner section having an outer surface, said inner section having an outer surface, said inner and outer surface being mutually separated to form said path defining surfaces.

C. a fan having a fan input port coupled to said output port.

4,295,417
WINDOW UNIT

Raymond H. Isley, Decatur, Ga., assignor to Isley Window Manufacturing Co., Inc., Decatur, Ga.

Filed Apr. 30, 1980, Ser. No. 133,916
Int. Cl.³ E06B *7/02*
U.S. Cl. 98—88 R **3 Claims**



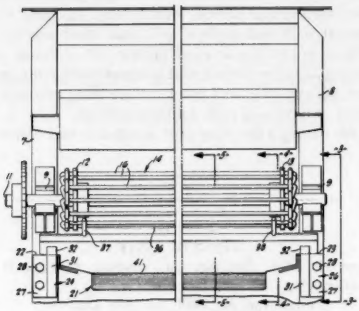
1. A window unit for a building comprising a peripheral frame, said window unit having a first facade in communication with exterior ambient air and a second facade in communication with interior ambient air, means within said frame defining multiple compartments stacked vertically one above the other, said multiple compartments comprising an upper compartment, a middle compartment and a lower compartment, said middle compartment comprising an exterior window pane and an interior window pane, said panes being spaced apart defining an air space therebetween, the upper and lower compartments being in communication with one another through the middle compartment, the upper and lower compartments having means for communication with the interior and exterior ambient air comprising a closure means in communication with the interior ambient air and a closure means in communication with the exterior ambient air, each of said closure means comprises a pair of horizontally sliding panels positioned for movement in track means and each panel being independently movable, means for preventing inclement weather from entering said upper and lower compartments comprising an awning structure mounted on the exterior facade above each of said upper and lower compartments, the interior window pane of the middle compartment being selectively removable from said frame.

4,295,418

CHAIN BROILER DOCTOR BLADE

Nils Lang-Ree, Los Altos, Calif., assignor to NPI Corporation, Burlingame, Calif.

Filed May 19, 1980, Ser. No. 151,325
Int. Cl.³ A47J *37/06*
U.S. Cl. 99—355 **2 Claims**



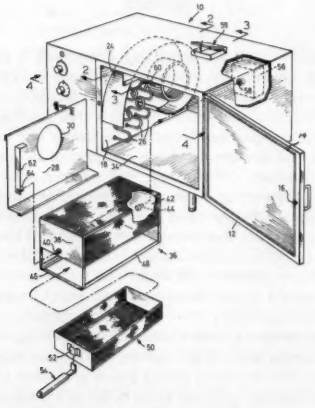
1. A chain broiler doctor blade construction comprising a frame, a chain conveyor mounted on said frame to extend in a path having upper and lower portions connected by a semi-circular arcuate rear portion, means engaging said frame and defining supporting sockets on said frame at opposite sides of said chain conveyor, a doctor blade extending transversely of said chain conveyor near said arcuate rear portion thereof, means forming shoulders on said doctor blade near the central side portions of said blade and tiltably disposed in said sockets, and rods extending from said doctor blade and adapted to abut said arcuate rear portion of said chain conveyor.

4,295,419

CONFINED AIR FOOD HEATING APPARATUS

Jerome Langhammer, Rexdale, Canada, assignor to Larry Poulson, Mission, Canada

Filed May 12, 1980, Ser. No. 148,966
Int. Cl.³ A47J *43/18*
U.S. Cl. 99—427 **6 Claims**



1. Means for cooking foodstuffs comprising:

a walled housing defining forward and rearward walls, and an opening in said forward wall;

means on said rearward wall for rotatably and removably mounting the rearward end of a food container;

means projecting into said opening adjacent the forward side of said housing for rotatably supporting the forward end of such container;

a container for foodstuffs designed to be removably rotatably mounted on said inward and outward mounting means;

means for rotating said container when so mounted;

said means for mounting the forward end of said container being designed: to be removable to allow said container from said housing through said opening and to expose at least a portion of said container below said forward mounting means;

said container when so mounted, and said forward and rearward mounting means being within said housing a door designed to substantially close said opening when said container is so mounted,

said container being provided with side openings to allow passage of air through foodstuffs therein,

said container being provided with means allowing removal of foodstuffs therefrom and the supply of foodstuffs thereto;

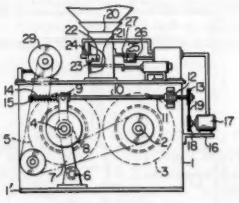
means for heating and circulating air in said housing.

4,295,420

AUTOMATIC CONTROL SYSTEM FOR HULLING MACHINE

Toshihiko Satake; Akira Kono; Takashi Horie, and Yasuharu Mitoma, all of Higashihiroshima, Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1980, Ser. No. 109,634
Claims priority, application Japan, Feb. 23, 1979, 54-6820; Mar. 13, 1979, 54-28298
Int. Cl.³ B02B *5/04*
U.S. Cl. 99—486 **14 Claims**



1. In a hulling machine comprising a hulling roll supported on a fixed main rotary shaft, another hulling roll supported on a movable auxiliary rotary shaft disposed parallel to said fixed main rotary shaft, a main electric motor for driving said two hulling rolls, means for supplying unhulled rice to the gap between said two hulling rolls and means for controlling the movement of the movable auxiliary rotary shaft, an automatic control system comprising:

(a) load detecting means for detecting the load applied to said main electric motor; and

(b) control means for connecting said load detecting means to said means for controlling the movement of the auxiliary rotary shaft.

4,295,421
SAFETY DEVICE FOR GUARDING NIPS IN A SHEET-FED ROTARY PRINTING PRESS

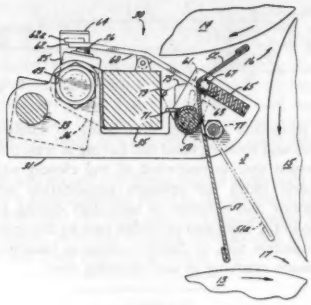
Paul Abendroth, Offenbach am Main, and Dietrich Dettinger, Dietzenbach, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 137,915

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914152

Int. Cl.³ B41F *5/00*

U.S. Cl. 101—216 **14 Claims**



1. In a sheet-fed rotary printing press the combination comprising a pair of side frames, lower and upper blanket cylinders in running engagement with an impression cylinder, the cylinders being so arranged as to define between them lower and upper nips having a horizontally accessible access space, driving means for the cylinders including an inching circuit and a drive enabling circuit, an interlock switch stationarily mounted adjacent the access space and connected in the drive enabling circuit, a safety subassembly mounted in the access space between the side frames, the subassembly having a horizontal shaft, a guard plate thereon, the guard plate being swingable between (a) a downwardly extending normal position in which the plate closes off the access space and serves as a sheet guide and (b) a horizontally extending alternate position in which it opens up the access space for manual cleaning, and a linkage coupling the guard plate to the interlock switch so arranged that when the guard plate is in its normal closing position the enabling circuit is enabled for normal driving of the press and so that when the guard plate departs from its normal position such circuit is disabled with operation of the press being thereby limiting to inching movement, the subassembly being bodily removable from the access space.

4,295,422
CAMLESS DRIVE OF A SWINGING PRE-GRIPPER FEEDER

Norbert Thünker, Grossachsen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

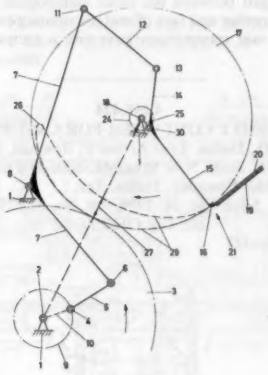
Filed Jun. 26, 1979, Ser. No. 52,257

Claims priority, application European Pat. Off., Jun. 26, 1978, 78/00234.0

Int. Cl.³ B41F *21/05;* **B65H** *5/10, 5/14*

U.S. Cl. 101—232 **3 Claims**

1. Camless drive of an oscillating pregripper feeder for a sheet-fed rotary printing machine having a fixed frame and a feed table, an impression cylinder rotatably mounted on said fixed frame and an oscillating pregripper feeder disposed between the feed table and the impression cylinder, the camless drive comprising a milti-bar linkage transmission system having bars mutually connected serially to one another and having pivot joints located at each of the mutual connections of said bars, two cranks articulatingly connected, on the one hand to the fixed frame and, on the other hand, to said transmission system and revolvable at the same angular velocity for driving said transmission system, one of said bars forming at least part of a pregripper of said oscillating pregripper feeder, said one bar being disposed directly behind and articulatingly connected to one of said cranks, said one bar being rigidly connected to a second bar, in turn, articulatingly connected by a coupler to a swing lever articulatingly connected to the fixed frame, said swing lever being drivingly swingable by a crank lever mechanism including the other of said two cranks, said oscillating pregripper feeder having means for gripping a sheet to be printed which lies on the feed table, and said multi-bar linkage transmission system being actuatable by said cranks for transporting the gripped sheet along a given path directly to the impression cylinder.



4,295,423
LIQUID DISTRIBUTING ROLLER ASSEMBLY FOR PRINTING MACHINES

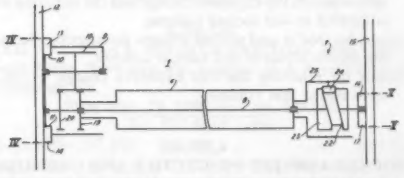
Hans Johne, Radebeul; Wolfgang Muller; Arndt Jentzsch, both of Coswig, and Günter Schumann, Radebeul, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 87,296, Oct. 22, 1979, abandoned. This application Nov. 16, 1979, Ser. No. 95,089

Claims priority, application German Democratic Rep., Oct. 28, 1978, 208737

Int. Cl.³ B41F *31/14, 27/16*

U.S. Cl. 101—349 **6 Claims**



1. A distributing roller assembly for distributing printing ink or a dampening liquid on a driven roller of a printing machine, said assembly comprising two stationary guiding tracks arranged opposite each other; a transmission gear unit formed of a housing supported for sliding movement on one of said tracks, a main shaft having one end thereof journalled in said housing and the other end thereof being supported for sliding movement and for rotation on the other track, a drive output gear rigidly connected to one end portion of said main shaft, a transmission gear journalled in said housing and being in mesh

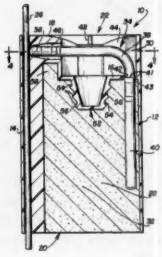
with said drive output gear, and a drive input gear supported for rotation and for axial movement on said one end portion of the main shaft and being in mesh with said transmission gear; a distributing roller supported for rotation and for axial movement on an intermediate portion of said main shaft, one end face of said distributing roller being connected to said input gear to impart rotary movement thereto when said driven roller of the machine is being operated; and an axial cam mechanism arranged between the other end portion of said main shaft and the other end face of said distributing roller to impart thereto via said transmission gear unit a reciprocating axial movement.

4,295,424

EXPLOSIVE CONTAINER FOR CAST PRIMER

Don H. Smith, Dallas, Tex.; Arthur F. Bowman, Tamaqua, and Norman M. Junk, New Ringgold, both of Pa., assignors to Atlas Powder Company, Dallas, Tex.

Filed Apr. 24, 1979, Ser. No. 32,777
Int. Cl.³ C06C *11/00*
U.S. Cl. 102—322 **16 Claims**



1. An explosive container for use with a detonator delay unit of the type having an initiating means and a delay detonator means and for containing a cast explosive charge comprising:

a hollow body having closed sides and two open ends with a tubular conduit disposed longitudinally on the exterior of said body, said tubular conduit being dimensioned to receive a detonating cord;

partition means contained within and attached to said hollow body, said partition means extending over a cross-section of said hollow body and dividing the interior of said hollow body into an open-ended first volume and an open-ended second volume, said first volume for containing the cast explosive charge, said partition means having an aperture therein to allow the detonator delay unit to be positioned wherein the delay detonator means is positionable adjacent the explosive charge and the initiating means is located in said second volume;

means located in said second volume for aligning the initiating means adjacent said tubular conduit;

means for retaining the cast explosive charge within said open-ended first volume.

4,295,425

ROCKET ASSISTED PROJECTILE AND CARTRIDGE ARRANGEMENT WITH PRESSURE RELIEF SKIRT

William O. Davis, Baltimore, Md., assignor to AAI Corporation, Cockeysville, Md.

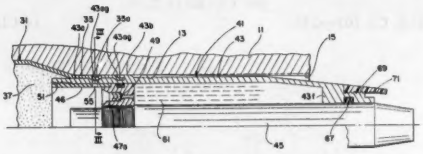
Filed Dec. 6, 1977, Ser. No. 857,957
Int. Cl.³ F42B *5/02, 11/14, 5/10*
U.S. Cl. 102—326 **12 Claims**

1. In a cartridge arrangement having a cartridge case containing ignitable propellant for propelling a rocket-assisted projectile and having an open forward mouth end for receiving and holding a projectile,

the improvement comprising:

a rocket-assisted projectile having a casing containing a rocket propellant grain and a nozzle block rearward of said rocket grain and having a discharge nozzle therein,

said projectile casing having an external rifling-engaging rotating band about a portion of the zone of said nozzle block, and an annular securing skirt extending rearwardly of said rifling band and said nozzle block and grippingly secured within and by said open forward mouth end of said cartridge case,



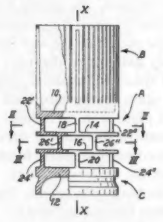
said projectile securing skirt being of smaller diameter than said rotating band and having at least one vent hole formed therein rearward of and closely adjacent said nozzle block for pressure equalization between the interior and exterior of said skirt during exit of said projectile from said cartridge case by the ignition of said propellant mix, to thereby minimize likelihood of hoop tension cracking of said securing skirt.

4,295,426

PLASTIC WADS AND WAD ASSEMBLIES FOR SHOT CARTRIDGES

Vito Genco, Rome, and Vincenzo L. Turco, Colleferro, both of Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Mar. 20, 1979, Ser. No. 22,361
Claims priority, application Italy, Mar. 22, 1978, 21258/78[U]
Int. Cl.³ F42B *7/08*
U.S. Cl. 102—451 **4 Claims**



1. A deformable plastic wad assembly for shot cartridges for hunting and shooting, said wad assembly comprising:

a first substantially rigid disc-like member extending perpendicular to a longitudinal axis of the wad assembly and forming a bottom of a shot container;

a second substantially rigid disc-like member extending perpendicular to said axis and forming a top of a seal adapted to be adjacent a powder charge; and

a reticular cushioning structure symmetric with respect to said axis and positioned between said first and second disc-like members, said cushioning structure comprising:

at least first and second discs axially spaced from each other and extending perpendicular to said axis, said discs being capable of bending in two opposite directions;

first and second ribs extending parallel to each other and to said axis on opposite lateral sides of said axis, said first and second ribs extending between and being connected to said first and second discs;

a first set of ribs extending between and being connected to said first disc-like member and said first disc, said first set

of ribs comprising a first diametral rib extending in a plane containing said axis and first and second lateral ribs located symmetrically on opposite sides of said first diametral rib and extending parallel to each other and to said first diametral rib, said first and second lateral ribs being disposed along and forming chords of the periphery of said first disc, which chords have lengths, in directions parallel to the plane of said first disc, which are less than the radius of said first dics;

a second set of ribs extending between and being connected to said second disc-like member and said second disc, said second set of ribs comprising a second diametral rib extending in a plane containing said axis and third and fourth lateral ribs located symmetrically on opposite sides of said second diametral rib and extending parallel to each other and to said second diametral rib, said third and fourth lateral ribs being disposed along and forming chords of the periphery of said second disc, which chords have lengths, in directions parallel to the plane of said second disc, which are less than the radius of said second disc;

all of said ribs being of a construction to resist axial loading; and

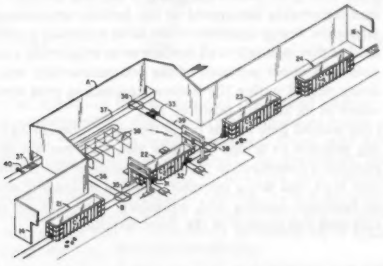
said first and second ribs being spaced from each other by a distance approximately equal to the distances spacing said first diametral rib from said first and second lateral ribs and to the distances spacing said second diametral rib from said third and fourth lateral ribs.

4,295,427

CAR REPAIR APPARATUS

Fred W. Waterman, Daly City; Jerry E. McCleery, San Francisco, both of Calif., and Robert T. McKie, Boise, Id., assignors to Morrison-Knudsen Co., Inc., Boise, Id. and Railcar Maint. Co., San Francisco, Calif.

Continuation of Ser. No. 895,685, Apr. 12, 1978, abandoned.
This application Jan. 9, 1980, Ser. No. 110,568
Int. Cl.[3] B61K *5/00*
U.S. Cl. 104—32 R **3 Claims**



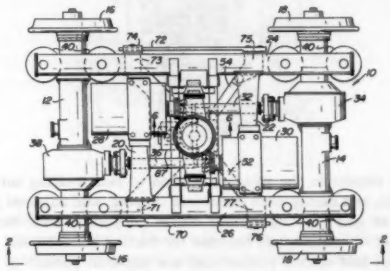
1. A railroad car repair station to lift and rotate a railroad car located at said car repair station comprising in combination: a track passing longitudinally of said car repair station; first and second gantries located at each end of said car repair station, at least one of said gantries including means for mounting said gantry for ground supported rolling movement substantially parallel to said track from a position removed from the ends of said car to a position confronted to the ends of said car; each gantry further including a substantially horizontal beam member attached at least one end to said gantry, said beam having an upward and downward movement on said gantries, said upward movement defining an unobstructed interval between said track and said beam member sufficient to permit the unobstructed passage of said car under said beam on said track, each said horizontal beam including means for grasping said car at an end of a car and means for rotating said car when said car is lifted between said grasping means and beam; whereby when said car is fastened to said beam and lifted by said beam, said car can be rotated, said means for grasping a car for rotating includes a bell crank mounted for rotation to said horizontal beam and having a male eccentric member for being received by the female coupler concavity of said car.

4,295,428

STEERABLE TRUCK FOR A RAILWAY VEHICLE

William W. Dickhart, III, Ft. Washington, and Richard H. Marvin, Philadelphia, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Apr. 13, 1979, Ser. No. 29,720
Int. Cl.[3] B61F *3/08, 5/20, 5/30*
U.S. Cl. 105—168 **9 Claims**



1. In a railway vehicle having a car body for use on rectilinear and curvilinear pairs of tracks, the combination comprising:

a. a truck for supporting said car body,

b. said truck including a pair of axles each having a pair of wheels mounted thereto,

c. a forced steering mechanism attached to said truck connected to steer at least one of said axles and a pair of wheels, said forced steering mechanism comprises a steering frame including at least two pivotable arms attached thereto to steer one of said pair of axles and two additional arms attached to steer the other of said pair of axles when forced steering becomes effective on curved tracks exceeding predetermined curvatures, and

d. means for loosely connecting said car body to said truck and said forced steering mechanism to permit limited relative lateral movement and self steering between said car body and said truck with said forced steering mechanism being maintained ineffective to cause forced steering when said vehicle is moving over rectilinear tracks, and to restrict said lateral movement and self steering and render said steering mechanism effective to cause forced steering when said vehicle is moving over curvilinear tracks exceeding predetermined curvatures.

4,295,429

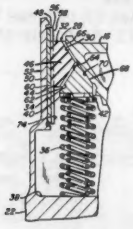
RAILWAY TRUCK BOLSTER FRICTION ASSEMBLY

Donald Wiebe, Sewickley, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.

Filed Mar. 24, 1980, Ser. No. 133,268
Int. Cl.[3] B60F *3/00*
U.S. Cl. 105—197 DB **10 Claims**

1. A railway truck bolster friction assembly adapted to be captively retained within a pocket of an elongated truck bolster member which extends between spaced elongated side frame members of a railway truck vehicle comprising: elastomeric friction means adapted to have a first portion thereof in communication with adjacent surfaces of such a pocket and a second portion thereof in frictional engagement with adjacent portions of wearing surface means of a column guide of a respective one of said side frames, said second portion being spaced longitudinally outwardly, with respect to the longitudinal axis of such a bolster member, from such a pocket and said first portion being spaced longitudinally inwardly from said second portion; said elastomeric friction means being operative

to deform and maintain said frictional engagement, without slipping between adjacent engaging surfaces, during at least initial vertical and transverse movements of such a bolster member with respect to such a respective one of said side frame members; during a subsequent transverse movement of such a bolster member with respect to such a side frame member, at least a section of said section portion slips transversely



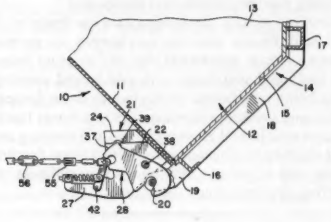
with respect to the adjacent portion of said wearing surface means; and during such transverse slipping, said adjacent portion of said wearing surface means cooperates with such a pocket to continuously increase the friction between said section of said second portion and said adjacent portion of said wearing surface means in direct proportion to the amount of said subsequent transverse movement.

4,295,430

RAILWAY HOPPER CAR LATCH MECHANISM

Willis H. Knippel, Palos Park, and Ray Ferris, Thornton, both of Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Feb. 25, 1980, Ser. No. 124,506
Int. Cl.[3] B61D *7/18, 7/22, 7/26*
U.S. Cl. 105—308 E **10 Claims**



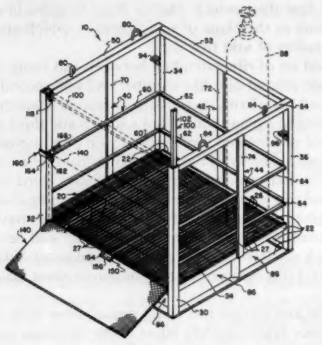
1. A closure locking mechanism for a railway hopper car including a discharge opening, closure means mounted for movement adjacent said opening and selectively closing the same and having a keeper rod disposed thereon, latching means positioned adjacent said closure means and adapted to engage and lock the same in its closed position, said latching means including bracket means attached to a hopper, a self-supporting latch member pivotally mounted by a pivot pin on said bracket means and having a keeper gathering opening adapted to move to one position to be aligned with said keeper rod to receive and hold the keeper rod and further to move to another position to latch the keeper rod, said latch member including a cam portion, and having a recessed abutment means, lever means pivotally mounted on said bracket means, and means biasing said lever means into engagement with said abutment means and said cam portion respectively whereby the latch member is positioned to initially engage the keeper rod and maintain it in said closed position.

4,295,431

PALLET FOR PRESSURIZED GAS CYLINDERS

Lars G. Stavlo, Sigtuna, Sweden, assignor to AGA AB, Sweden

Filed Nov. 23, 1979, Ser. No. 96,689
Int. Cl.[3] B65D *19/00*
U.S. Cl. 108—55.1 **13 Claims**



1. A pallet, comprising:

(a) first structure defining a floor having an elevated top surface;

(b) second structure defining a substantially continuous side wall extending upwardly above the top surface of the floor structure and having opposite end formations leaving an open side wall portion therebetween, one of the end formations including a hollow upstanding post structure;

(c) first and second gate means, each being connected to at least one of the first and second structures and each being movable between a retaining position and a loading position providing substantially no obstruction to loading and unloading of the pallet through the open side wall portion;

(d) the first gate means including a bar-like member being non-removably connected to the hollow upstanding post structure, being operable when in its retaining position to bridge the open side wall portion so as to provide a continuation of upper portions of the continuous side wall, and being nested within the hollow upstanding post structure when in its loading position; and,

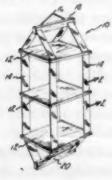
(e) the second gate means being operable when in its retaining position to bridge the open side wall portion so as to provide a continuation of lower portions of the continuous side wall, and being operable when in its loading position to facilitate loading and unloading onto and off of the elevated top surface of the floor structure.

4,295,432

HANGING SHELVES

Donald B. Hulke, 14254 Ash Cir. Northeast, Prior Lake, Minn. 55372

Filed Dec. 20, 1979, Ser. No. 105,512
Int. Cl.[3] A47B *47/06*
U.S. Cl. 108—149 **13 Claims**



1. A hanging shelf apparatus comprising:

webbing means;

a shelf having a pair of opposing sides and an upper and a lower surface, each side having a recess proximate both ends with a depth equal to at least the width of the webbing means and a slot with a length approximately equal to the width of the webbing means communicating with and along each recess and communicating with the upper and the lower surface of the shelf, the slot and the recess being positioned to receive and hold the webbing means such that the webbing means extends through the upper and lower surfaces; and

recess engaging plug means having a width sufficient for frictionally engaging the webbing means against a surface of the recess to connect the webbing means and the shelf.

4,295,433

TAKE-UP DRIVE FOR A MULTI-HEAD EMBROIDERY MACHINE

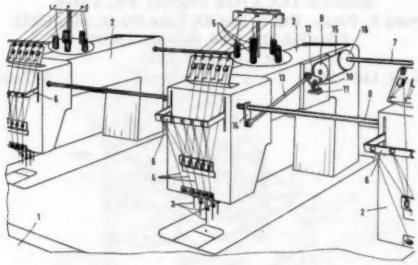
Alfred Desprez, Wachtendonk; Heinz Sauerland, Neukirchen-Vluyn, and Wolfgang Teetz, Kerken, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 64,273

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835185

Int. Cl.³ D05C *11/00, 7/00*

U.S. Cl. 112—241 **7 Claims**



1. In an apparatus for the drive of the thread take-up on a multi-head embroidery machine having a machine frame, with a plurality of embroidery heads arranged in a row, with at least one embroidery needle in each head, the oscillating thread take-up comprising a thread take-up lever for each embroidery head respectively, which thread take-up lever is mounted on the respective embroidery head pivotable back and forth about a horizontal axis and is operatively driveable by a machine main shaft, the improvement comprising

one common thread take-up shaft extending to and passing through all of the embroidery heads,

said thread take-up levers of all of the embroidery heads are secured on said common thread take-up shaft,

means comprising a single crankdrive mechanism for driving said common thread take-up shaft by the machine main shaft.

4,295,434

FEED MECHANISM FOR SEWING MACHINES

James C. Hsiao, Morton Grove, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Oct. 24, 1979, Ser. No. 87,906

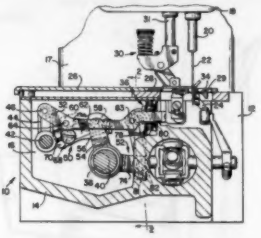
Int. Cl.³ D05B *27/02*

U.S. Cl. 112—314 **20 Claims**

1. A sewing machine having a frame, work support means, revoluble shaft means arranged in said frame beneath said work support means, eccentric means carried by said shaft means and a feed mechanism comprising:

feed bar means;

feed dog means carried thereby; drive mechanism means including a series of connected link means operatively associated with said eccentric means for imparting motion to said feed bar means in mutually perpendicular directions, one direction being transversely across said frame to provide work advancing and return movements, the other direction being toward or away from said work support means so as to lift said feed dog means to a position above



said work support means during the work advancing movement and to lower said feed dog means below said work support means during the return movement; and

means associated with said drive mechanism means for allowing rising and falling movements to be translated from said eccentric means to said feed bar means including means for modulating the amplitude of lift being imparted to said feed dog means.

4,295,435

CLOTH FEED APPARATUS

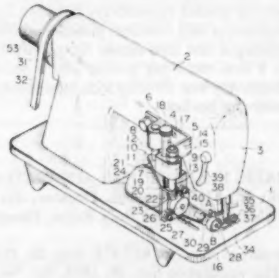
Tamio Uemura, Kawasaki; Yoshimasa Ito, and Takahiro Itakura, both of Yokohama, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Aug. 30, 1979, Ser. No. 71,289

Claims priority, application Japan, Sep. 12, 1978, 53-11876

Int. Cl.³ D05B *27/14*

U.S. Cl. 112—322 **12 Claims**



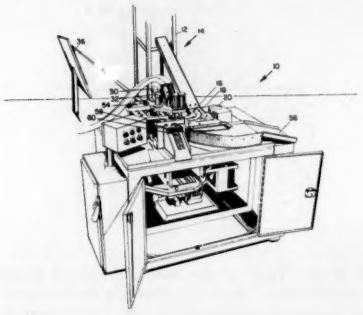
1. A cloth feed apparatus for a sewing machine comprising a needle and a feed dog which is coupled to a main driving shaft, rotor means coupled to said main shaft for rotation in synchronism therewith, detector means for detecting the rotation of said rotor means to generate directly a plurality of pulses in cooperation with said rotor means, stepping motor means actuated in accordance with the pulses generated by said detecting means, and rotary mechanism means driven by said stepping motor means and feeding the cloth fed by the feed dog.

4,295,436

CAP LINING MACHINE

Dominic V. Zangari, 6 Drew La., Hightstown, N.J. 08529, and Douglas R. Cranston, East Brunswick, N.J., assignors to Dominic V. Zangari, Hightstown, N.J.

Filed May 15, 1979, Ser. No. 39,220
Int. Cl.³ B21D *51/46*
U.S. Cl. 113—80 D **11 Claims**



1. A cap lining apparatus for cutting a cap liner from a web of lining material and placing said cap liner in a cap, said apparatus comprising:

a hollow anvil means;

a hollow score cutting means for cutting said web, said anvil means and said score cutting means being lined up coaxially so that the hollow portions of said anvil means and said score cutting means form a cavity;

web feed means for transporting said web between said anvil means and said score cutting means;

anvil drive means for driving said anvil means against said score cutting means;

pusher means for pushing said cap liner into said cap, said pusher means being located in the cavity formed by said anvil means and said score cutting means, said cavity being large enough to allow said pusher means to reciprocate therein;

a rotatable means for holding said caps, said rotatable means including a plurality of cap receiving pockets therein;

indexing means for indexing said rotatable means; and,

feed means for presenting at least two caps to a first and second receiving pocket respectively between successive indexing rotations of said rotatable means, said feed means further including a first feed means for gravity feeding a first cap to a first receiving pocket and a second feed means for positively and directly feeding a second cap to a second receiving pocket.

4,295,437

AUTOMATIC FLARE SIGNAL APPARATUS

George W. Mock, Jr., 5315 Carinleigh, Houston, Tex. 77084, and George W. Mock, Sr., 13206 Boca Raton, Houston, Tex. 77069

Continuation-in-part of Ser. No. 937,473, Aug. 28, 1978, Pat. No. 4,205,619. This application Sep. 26, 1979, Ser. No. 78,914
Int. Cl.³ G08B *21/00*
U.S. Cl. 116—202 **4 Claims**

1. An apparatus for signalling separation between a first structure and a second structure, comprising:

attachment means for connecting the first structure and the second structure, said attachment means including an elongated member of a predetermined length;

signalling means responsive to the disconnection of said attachment means for indicating said disconnection, said signalling means including a lanyard cable running parallel to said attachment means, said lanyard cable being substantially the same length as said elongated member, said length of said lanyard cable being such that said lanyard cable is subjected to tension stresses after said disconnection of said attachment means;

an alarm box attached to the second structure, including alarm means for alerting operators of said disconnection of said attachment means substantially immediately upon the happening of said disconnection; and

triggering means comprising a trigger bar, said lanyard cable being removably attached to said trigger bar;

said trigger bar extends into the interior of said alarm box thereupon depressing and opening a pneumatic safety valve when said tirgger bar is pulled out of said alarm box by said lanyard cable; and

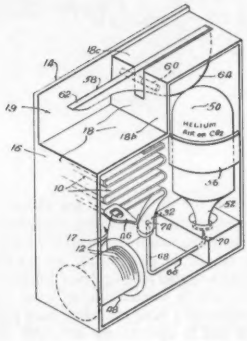
said triggering means includes a compressed air tank supplying pressure to a regulator valve and said pneumatic safety valve, both controlling a pneumatic piston which drives a firing pin into a signal flare when said safety valve is opened to compressed air flow from said air tank.

4,295,438

RESCUE LOCATOR SIGNAL PACKAGE

Howard L. Porter, Rte. 5, Box 83, Lake Placid, Fla. 33852

Filed Feb. 25, 1980, Ser. No. 124,097
Int. Cl.³ G09F *9/00*
U.S. Cl. 116—210 **5 Claims**



1. A rescue locator package comprising,

a casing,

a deflated and collapsed balloon in the casing, and having a fillable end with a self-closing valve therein,

a cartridge of compressed gas in the casing and movable between an inactive position and an active position, means normally holding the cartridge in its inactive position and so holding it in normal handling of the package,

a needle tube fixedly mounted in the casing having one end extending through the self-closing valve in the balloon and communicating with the interior of the balloon and the other end having a puncturing point positioned and operable for puncturing the cartridge when the cartridge is moved to active position, and the needle tube, in response to so puncturing the cartridge, extending into the cartridge and thereby establishing communication between the cartridge and the balloon, filing the balloon with the gas,

the fillable end of the balloon being friction-held on the needle tube, and the remainder and body portion of the balloon being loosely contained in the casing and expella-

ble therefrom in response to being filled, and pursuant to being so expelled being normally friction-held on the needle tube and the latter holding the balloon until it is manually released therefrom,

a tether line interconnecting the fillable end of the balloon and the casing, and

manually manipulable means for moving the cartridge to active position and thereby puncturing it,

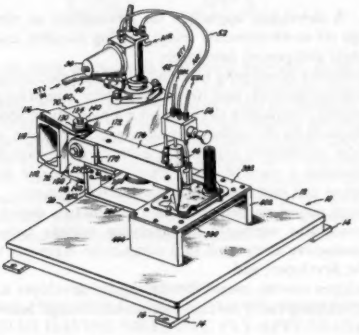
the manually manipulable means having at least a portion extending into the interior of the casing, and all of the remaining elements being entirely contained in the casing.

4,295,439

HAND OPERATED APPARATUS FOR APPLYING A GASKETING COMPOSITION

Edward G. Kruszona, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Sep. 25, 1979, Ser. No. 78,754
Int. Cl.³ B05B *13/04*
U.S. Cl. 118—317 **12 Claims**



1. A hand operated machine for applying a gasketing coposition on a part comprising,

a frame;

a base on said frame in which is placed said part on which said gasketing composition is applied;

template means corresponding to a said part and having track means therewith corresponding to said template;

a vertical support mounted on said frame;

a horizontally movable arm connected at one end to said support and a horizontally movable joint means pivotally mounted at the other end;

first forearm means extending from said joint means and pivotally mounted thereon for movement in a vertical plane;

second forearm means extending from said joint means and supporting roller means operatively associated with said track;

means for dispensing said composition mounted on said first forearm such that it travels in fixed relationship to said roller means;

trigger means for activating said dispensing means; and

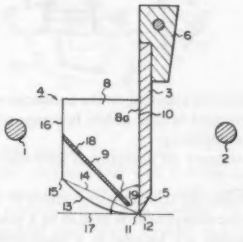
means for imparting motion to said assemblage of arms and joint means whereby movement of said roller means about said track is associated with movement of the dispenser in a path to effect application of the gasketing composition to said part.

4,295,440

APPARATUS FOR CONTINUOUSLY COATING A SHEET MATERIAL CONCURRENTLY WITH A PLURALITY OF STRIPES

Shinzo Nakai, Tokyo, and Chitomi Shimizu, Matsudo, both of Japan, assignors to Hiraoka & Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1980, Ser. No. 124,948
Claims priority, application Japan, Feb. 28, 1979, 54-23101
Int. Cl.³ B05C *3/18*
U.S. Cl. 118—412 **11 Claims**



1. An apparatus for continuously coating a sheet material concurrently with a plurality of coating liquids in the pattern of a plurality of stripes, which apparatus comprises:

(1) means for feeding a sheet material and means for delivering said sheet material;

(2) a substantially vertical coating doctor knife having a blade formed in the lower end portion thereof and arranged between the sheet material-feeding means and the sheet material-delivering means, and;

(3) a coating liquid-feeding device attached to a front surface of said doctor knife, which front surface faces said sheet material-feeding means, and having a plurality of compartments, each of which compartments is defined by:

(A) a pair of substantially vertical partitioning plates which are parallel to each other, spaced from each other and connected to the front surface of said doctor knife in such a manner that a side edge surface of each partitioning plate is in close contact with the front surface of the doctor knife, and a lowermost end of the side edge surface is at substantially the same level as that of a lowermost end of the blade of said doctor knife, and each of which partitioning plates has a bottom edge thereof having a profile in the shape of an arc bulged downwardly from an imaginary straight line drawn between the lowermost end of the side edge of said partitioning plate adjacent the doctor knife, and a lowermost end of another side edge of said partitioning plate, and;

(B) an inclined guide plate interposed between said pair of partitioning plates and having an inclined upper surface thereof obliquely, downwardly approaching the blade of said doctor knife, and a lower end thereof located close to the blade of said doctor knife, said guide plate also having a lower surface located inside the bottom edges of said pair of partitioning plates.

4,295,441
APPARATUS FOR APPLYING SOLDER TO THE CONNECTIONS OF INTEGRATED CIRCUIT COMPONENTS

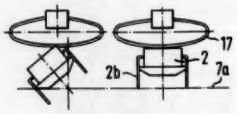
Anton Forstner, and Kurt Schatzmann, both of Dietikon, Switzerland, assignors to Siemens-Albis Aktiengesellschaft, Zürich, Switzerland

Filed Nov. 24, 1980, Ser. No. 209,665

Claims priority, application Switzerland, Jan. 30, 1980, 738/80

Int. Cl.³ B05C *3/09*

U.S. Cl. 118—425 **6 Claims**



1. An apparatus for applying to the connections of integrated components arranged in dual-in-line housings solder located in a solder bath, comprising:

at least one support for carrying at least one of the components;

means for displacing said support relative to the solder bath such that the component is placed in a position in which its connections are located at a predetermined distance above the surface of the solder bath;

means for tilting the support in such position about an axis extending essentially parallel to the connections of the component carried by the support and into a position which is inclined with respect to the surface of the solder bath; and

the connections of a connection row of the component, following tilting of the support to one or the other side, simultaneously immersing into the solder bath.

4,295,442
MAGNETIC TONER APPARATUS

James B. Thaxter, Townsend, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 4, 1978, Ser. No. 931,214

Int. Cl.³ G03G *15/09*

U.S. Cl. 118—657 **8 Claims**

1. An improved electrophoretic printer of the type having a recipient sheet, a printhead, a supply of toner, and a transfer surface having first and second sides, for conveying the toner to the printhead for transferring the toner to the recipient sheet to form an image thereon, wherein the improvement comprises:

a magnetic roller disposed in magnetic relationship to the supply of toner and opposite the first side of the transfer surface, having an inner magnetic surface and outer cylindrical shell, for generating magnetic field gradients and magnetically attracting the toner to the outer cylindrical shell; and

a high permeability backing plate disposed opposite the second side of the transfer surface and aligned with the magnetic roller cooperating therewith for modifying the magnetic field gradients by magnetization induced in the high permeability backing plate having a selectively profiled surface to produce selectively profiled gradients and for transferring the toner from the roller to the transfer surface in a controlled, uniform thickness.

4,295,443
DEVELOPING APPARATUS FOR ELECTROSTATIC COPYING MACHINE

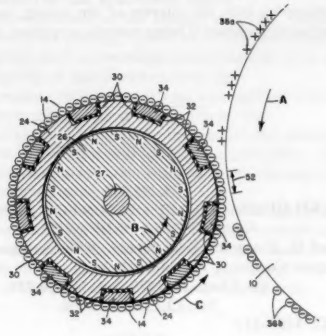
Mitsuaki Kohyama, Higashikurume, Japan, assignor to Toshiba Corporation, Kawasaki, Japan

Filed Mar. 25, 1980, Ser. No. 133,664

Claims priority, application Japan, Apr. 18, 1979, 54-47524

Int. Cl.³ G03G *15/09*

U.S. Cl. 118—657 **9 Claims**



1. A developer apparatus for developing an electrostatic image on an electrostatic image bearing member, comprising:

a single component developer;

a stationary developing roller adjacent said electrostatic image bearing member, said developing roller comprising an electrically conductive sleeve having a plurality of spaced apart channels on the surface of said conductive sleeve, an electrically conductive segment in each of said channels and an insulator in each of said channels between said conductive sleeve and said electrically conductive segment;

voltage means connected to said conductive sleeve and said conductive segments for applying voltage between said conductive sleeve and said conductive segments to charge the developer; and

developer moving means for moving the developer across said developing roller to said electrostatic image bearing member.

4,295,444
AUTOMATIC COATING SYSTEM FOR LOST WAX PROCESS

Masami Hatta, Matsue; Katsumi Iwata, Saihakugun, and Masao Sasaki, Fujisawa, all of Japan, assignors to Hitachi Metals Precision, Ltd., Tokyo, Japan

Filed Dec. 18, 1979, Ser. No. 104,854

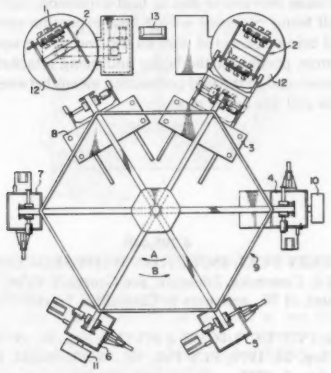
Claims priority, application Japan, Dec. 22, 1978, 53-157613; Dec. 22, 1978, 53-174971[U]; Dec. 22, 1978, 53-174972[U]

Int. Cl.³ B05C *3/02, 3/09*

U.S. Cl. 118—668 **18 Claims**

1. An automatic coating system for making a set-up by coating a wax pattern with a refractory material in lost wax process, comprising a set-up pickup device adapted for picking set-ups one by one from a set-up storage section, whereby said set-ups enter said system; a slurry dipping device adapted for receiving said set-ups and for dipping said set-ups in a slurry of a coating refractory material; a sanding device adapted for receiving said set-ups and for depositing sand on the surface of said set-ups; and a set-up taking-out device for removing said set-ups out of said system; said devices being disposed on a common circle; said automatic coating system further comprising a set-up transportation device, wherein said set-up transportation device is disposed at the center of said circle and includes a vertical column, cylinder means attached to said vertical column, a guide member attached to said vertical

column, a main shaft movable up and down by the operation of said cylinder means along said guide member attached to said vertical column, a rotational driving means attached to said vertical column and adapted to cause a rotation of said main shaft around its own axis, a plurality of beams attached to the upper end of said main shaft and extending radially outwardly in a plane perpendicular to the axis of said main shaft, each beam having attached to an end thereof farthest from said main shaft an arm, a cylinder mounted on each beam, slide shafts



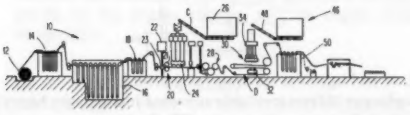
mounted on each beam, each arm being movable along said slide shafts attached to said beam in the longitudinal direction of said beam by the operation of said cylinder mounted on said beam, each arm having means for holding, rotating and centering said set-ups, whereby said set-up transportation device is adapted to vertically move the set-ups and move said set-ups rotationally from one device to the next respective device around said common circle, for transporting said set-ups from predetermined positions in respective devices to predetermined positions in respective next devices.

4,295,445

APPARATUS FOR MANUFACTURING ROOFING SHINGLES HAVING MULTIPLE PLY-APPEARANCE

Robert Kopenhaver, Berwyn, Pa., assignor to Certain-teed Corporation, Valley Forge, Pa.

Filed Jun. 20, 1977, Ser. No. 808,171
Int. Cl.³ B05C *1/08, 1/16, 19/00*
U.S. Cl. 118—695 **16 Claims**



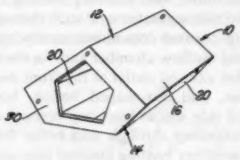
1. An improved apparatus for manufacturing roofing shingles from dry roofing material comprising, means for continuously feeding dry roofing material into said apparatus, an asphalt saturation tank for receiving, saturating and coating said dry material with asphalt, means for applying a first continuous coating of granules to said saturated and coated material, means for cutting said material into roofing shingles of a given length and a given width, wherein the improvement comprises, means disposed between said means for applying a first coating of granules and said cutting means for automatically applying a repeated series of spaced apart bands of granules to said first continuous coating of granules, said series of bands having various widths and periodically applied along said first continuous coating at a predetermined periodicity, such that said series of bands are applied to said first coating of granules over a length different than said given length of shingle, whereby varying portions of said series of bands will be present on each of said given length of shingle.

4,295,446

COLLAPSIBLE SHELTER

Clifford C. Voss, 406 Donald Ave., Clawson, Mich. 48017

Filed Feb. 13, 1980, Ser. No. 121,265
Int. Cl.³ A01K *1/03*
U.S. Cl. 119—19 **5 Claims**



1. A collapsible shelter, comprising;

a wrap-around roof and side wall forming part having the relatively opposite wrap-around ends thereof adapted to form and provide a floor area therefor,

said wrap-around part being formed and dimensioned to have a roof area equivalent to that of the side walls and floor area together for allowing said roof, side wall and floor areas to be collapsed and folded flatly together,

and end wall parts formed to fit and close the open ends of said first mentioned part, as erected, and to otherwise lie flatly thereon and therewith,

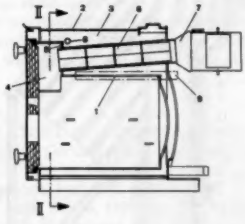
said end wall parts being interconnected together and relatively spaced to be folded and fitted into the open ends of said first mentioned part, as erected, and to be folded flatly together, one over the other.

4,295,447

HEATING BOILER AND TEMPERATURE CONTROL THEREFOR

Adolf Heeb, Vaduz, Liechtenstein, assignor to Interliz Anstalt, Vaduz-Neugut, Liechtenstein

Filed Sep. 5, 1979, Ser. No. 72,755
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841476
Int. Cl.³ F22B *7/00*
U.S. Cl. 122—136 R **2 Claims**



1. In a heating boiler having a substantially horizontally extending combustion chamber for combustion of liquid or gaseous fuel, said combustion chamber having a cylindrical cross sectional configuration and having a front end and a closed rear end, said combustion chamber having at said front end thereof a flue exhaust outlet, a boiler water chamber surrounding said combustion chamber, said boiler water chamber being defined by a boiler body of oval-shaped cross sectional configuration, said combustion chamber being disposed within

the lower region of said boiler body, a thermostat probe having a sensor section extending into said boiler water chamber, an auxiliary heating channel positioned above said combustion chamber within the boiler water chamber to extend longitudinally of the combustion chamber, said auxiliary heating channel comprising a box-shaped hollow body disposed within the upper region of said boiler body, a return pipe extending into the boiler water chamber for fthe discharge of return water thereinto, an outflow chamber surmounting said flue exhaust outlet, said outflow chamber comprising a separator wall which separates said outflow chamber from said boiler water chamber, said outflow chamber being in communication with said flue exhaust outlet, said auxiliary heating channel having an inlet joined to said separator wall such that said inlet of said auxiliary heating channel communicates through said separator wall with said outflow chamber and via the outflow chamber with said flue exhaust outlet at the front end of said combustion chamber, said box-shaped hollow body having an upper horizontal side and at least one vertical side, said thermostat probe extending through said boiler body and transversely of said auxiliary heating channel into said boiler water chamber to terminate in said sensor section above said upper horizontal side of said auxiliary heating channel and adjacent to said separator wall, said return pipe extending within said boiler water chamber from the rear end of said boiler body and along side said vertical side wall of said auxiliary heating channel, the discharge end of said return pipe being disposed below said thermostat probe, said sensor section of the thermostat probe being disposed above said inlet of said auxiliary heating channel and adjacent to said separator wall, the discharge end of the return pipe being located within said boiler water chamber in the vicinity of said sensor section such that said sensor section of the thermostat probe is directly washed by the discharged return water.

4,295,448

GAS GENERATOR FOR FINE-GRAINED COAL FUELS

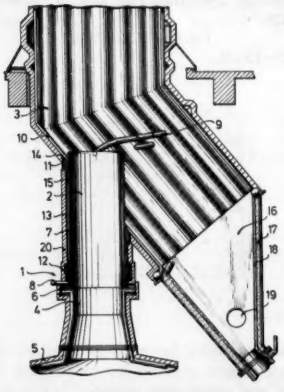
Reinhard Waldhofer, Essen, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,791

Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920372

Int. Cl.³ F22B *7/18*; C10J *3/48*

U.S. Cl. 122—164 **7 Claims**



1. A gas generator for operation on a fuel of fine grained coal, the said generator comprising

a steam boiler,

a combustion chamber,

a stack leading from the combustion chamber to the steam boiler,

a slanting bottom portion forming the lower part of the steam boiler for the discharge of flue ash and slag,

a gas outlet pipe attache o the combustion chamber and forming the lower part of said stack,

a gas inlet pipe leading to the boiler and forming the upper part of said stack,

connecting means attaching the gas inlet pipe to the said gas outlet pipe, the said gas inlet pipe having a double wall of which the inner wall with its top extends freely into said slanting bottom portion of the boiler and thus is adapted for axial movement due to heat expansion, and the outer wall being provided with a heat expansion compensator and being connected with its top end to the said slanting bottom portion of the boiler and being attached with its bottom end to the said connecting means between said gas inlet and gas outlet pipes.

4,295,449

ROTARY FUEL INJECTION WITH SEQUENCING

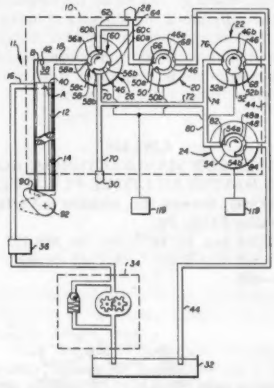
Richard A. Cemenska, Edelstein, and George B. Grim, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00762, § 371 Date Sep. 24, 1979, § 102(e) Date Sep. 24, 1979, PCT Pub. No. WO81/00884, PCT Pub. Date Apr. 2, 1981

PCT Filed Sep. 24, 1979, Ser. No. 99,137

Int. Cl.³ F02M *41/06*

U.S. Cl. 123—300 **22 Claims**



1. A fuel injection apparatus comprising:

a plunger (**12**) reciprocably mounted in a plunger bore (**14**) to define a pumping cavity (**38**) therein;

means (**20,22,24**) for starting and stopping pilot injection and main injection of said fuel by alternately permitting pressurization and venting of said pumping cavity (**38**), said means for starting and stopping including a plurality of continuously rotating valves (**46,48**), said valves being fluidly connected to the pumping cavity (**38**) defined in said plunger bore (**14**);

a first nozzle (**28**);

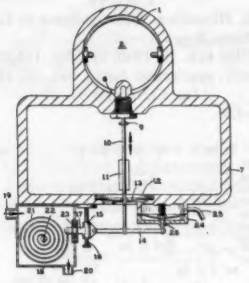
a second nozzle (**30**); and

(means (**26**) for sequentially directing said fuel from the pumping cavity (**38**) of said plunger bore to said first and second nozzles (**28,30**) for controlling said pilot injection through said first nozzle (**28**) and main injection through said second nozzle (**30**).

4,295,450
THERMAL AND VACUUM TRACKING CARBURETOR JET

Ralph Muscatell, 200 N.E. 20th Ave., Fort Lauderdale, Fla. 33305

Filed Dec. 19, 1978, Ser. No. 970,994
Int. Cl.[3] F02M 7/00, 1/04
U.S. Cl. 123—435 2 Claims



1. In a carburetor system for an internal combustion engine, said system having:
- means defining a fuel chamber;
- a fuel mixing conduit having an air inlet at one end and a fuel/air outlet at the opposite end, a venturi throat between said inlet and said outlet, and a throttle valve between said throat and said outlet;
- a fuel nozzle operatively arranged to discharge fuel into said throat;
- means defining a metering orifice operatively connected between said fuel chamber and said nozzle to supply fuel to said nozzle;
- a valve member adjustably positioned at said metering orifice to control the flow of fuel therethrough;
- and means responsive to the engine vacuum to adjust said valve member in a direction to increase the flow of fuel to said nozzle when the engine vacuum diminishes and in the opposite direction to decrease the flow of fuel to said nozzle when the engine vacuum increases;

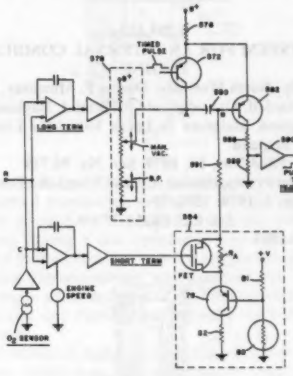
the improvement which comprises:
- a temperature sensor operatively arranged to sense the temperature of the engine exhaust;
- and means acting between said temperature sensor and said valve member to adjust the latter in a direction to increase the flow of fuel to said nozzle in response to an increased temperature of the engine exhaust and in the opposite direction to decrease the flow of fuel to said nozzle in response to a decreased temperature of the engine exhaust, whereby the richness of the fuel/air mixture is controlled jointly by the engine vacuum and the engine exhaust temperature.

4,295,451
CLOSED LOOP FUEL CONTROL FOR INTERNAL COMBUSTION ENGINE

E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 929,156, Jul. 31, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,820
Int. Cl.[3] F02M 7/00
U.S. Cl. 123—438 4 Claims

1. A closed loop fuel injection system for proportioning a mixture of air and fuel delivered to an internal combustion engine comprising:
- (a) sensor means for producing an electrical signal having a magnitude that varies in proportion to the concentration of exhaust gas from said engine;
- (b) first electrical circuit mean responsive to said electrical signal to compensate for small amplitude, short term disturbances in said electrical signal, said first circuit means having high gain, low stability and restrictive modification capability over said electrical signal, for providing a first circuit signal with an amplitude limited to a small value;
- (c) second electrical circuit means responsive to said electrical signal to compensate for large amplitude, long term disturbances in said electrical signal, said second circuit means having low gain, high stability, and large modification capability over said electrical signal for providing a second circuit signal with a large amplitude;
- (d) said first circuit means having a response time that varies directly with and is substantially the same as the time between formation and detection of said air fuel mixture, and being adapted to correct any part of said large amplitude disturbances that is not corrected by said second circuit means;



- (e) said second circuit means having a response time longer than the response time of said first circuit means, and being adapted to at least partially correct said large amplitude disturbances;
- (f) means for combining the first and second circuit signals to produce a composite pulse of variable width to fix the proportion of air-fuel in said mixture;
- (g) means for applying said composite pulse to an injector of said internal combustion engine;
- (h) wherein said means for combining includes a timing means connected to receive said circuit signals, means for enabling said timing means, said timing means being enabled in response to said enabling means and producing a timing signal having a time period responsive to said first and second circuit signals, said composite pulse of variable width produced by said means for combining, having a variable width responsive to said time period.

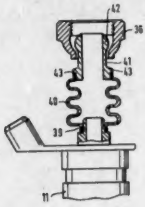
4,295,452
FUEL INJECTION SYSTEM

Manfred Lembke, Gerlingen, and Heinrich Knapp, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 45,894
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2829057
Int. Cl.[3] F02M 53/04
U.S. Cl. 123—470 6 Claims

1. A fuel injection system for internal combustion engines comprising a metallic fuel distributor tube which is in communication with a pressure regulator and a fuel supply pump, at least one fuel injection valve, at least one fuel branch line made of bendable metal connected at one end to said metallic fuel

distributor tube and at its opposite end to at least one fuel injection valve, a threaded assembly for connecting said bend-



able metal branch line to said fuel injection valve and a thin-walled bellows interposed between said threaded assembly and said fuel injection valve.

4,295,453

FUEL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

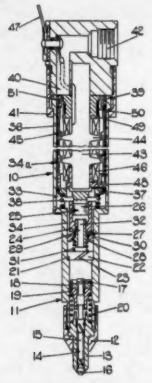
Alec H. Seilly, North Wembley; Dorian F. Mowbray, Burnham; John E. Mardell, Uxbridge, and Michael J. Davison, London, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 16, 1979, Ser. No. 94,719

Claims priority, application United Kingdom, Feb. 9, 1979, 4724/79; Mar. 3, 1979, 7556/79

Int. Cl.³ F02M *37/04*

U.S. Cl. 123—499 **7 Claims**



1. A fuel system for an internal combustion engine of the type in which fuel is injected into a combustion space of the engine, the system being of the kind comprising an injection nozzle positioned on the engine so that fuel delivered to the nozzle will be injected into the combustion space and an injection pump for delivering fuel to the nozzle in timed relationship with the engine, the pump comprising a piston movable in a bore to vary the size of a pumping chamber, resilient means biasing the piston in a direction to increase the size of the pumping chamber, electromagnetic means operable to move the piston against the action of the resilient means to displace fuel from the pumping chamber through the associated nozzle, a valve controlled fuel inlet to said pumping chamber and through which fuel can flow into the bore from a source of fuel when the piston is moved by the action of the resilient means, the system including first electronic means for supplying power to the electromagnetic means for a period of time during which the piston is moved to deliver fuel from the pump, the electromagnetic means at the end of said period of time being de-energised to allow return movement of the piston under the action of the resilient means and second electronic means operable to supply a holding current to said electromagnetic means to halt the return movement of said piston after the required amount of fuel has been drawn into the pumping chamber.

4,295,454

HEATED FUEL INTAKE SYSTEM IN AUTOMOBILE ENGINE

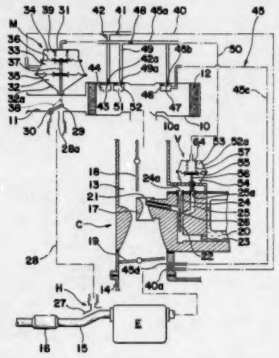
Yoshihiko Iida, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Feb. 25, 1980, Ser. No. 124,239

Claims priority, application Japan, Feb. 24, 1979, 54/21175

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—556 **13 Claims**



1. In an automobile internal combustion engine comprising an air cleaner, an intake passage leading from the air cleaner to the engine for the passage of air therethrough to the engine from the atmosphere by way of the air cleaner, a fuel supplying means for introducing a controlled amount of fuel into the intake passage, a heated fuel intake system which comprises:

a heating means for heating the air to a predetermined temperature when the temperature of the atmosphere is lower than the predetermined temperature, and heating the air to another predetermined temperature when the temperature of the atmosphere is higher than the predetermined temperature and lower than the another predetermined temperature; and

means for compensating for the increased richness of the air-fuel mixture to be fed to the engine when the temperature of the atmosphere is higher than the predetermined temperature.

4,295,455

EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR A COMPRESSION-IGNITION INTERNAL COMBUSTION ENGINE

Seishi Yasuhara; Jun Teranuma, both of Yokosuka; Motohiro Shinzawa, Zushi, and Hiroshi Fujii, Yokohama, all of Japan, assignors to Nissan Motor Co. Ltd, Yokohama, Japan

Filed Oct. 2, 1979, Ser. No. 81,144

Claims priority, application Japan, Oct. 9, 1978, 53-124421

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **9 Claims**

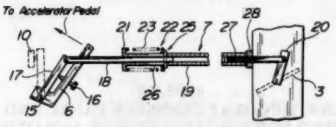
1. An exhaust gas recirculation control system for a compression-ignition internal combustion engine having an intake throttle valve in an intake passage and an exhaust gas recirculation passage opening located downstream of the intake throttle valve, comprising

(a) a shutoff valve in the exhaust gas recirculation passage;

(b) control means of a fuel injection pump, said control

means interconnected with the shutoff valve, said shutoff valve being closed in proximity to a full load region of the engine; and

(c) a link mechanism interconnecting the intake throttle valve and control means, said link mechanism including



delay means for initiating opening of the intake throttle valve at a time following commencement of operation of the control means of the fuel injection pump and means for completely opening said intake throttle valve before said control means reaches a full operating position.

4,295,456

EXHAUST-GAS-RECIRCULATION SYSTEM FOR USE IN DIESEL ENGINES

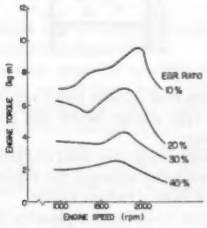
Etsuji Nomura, Okazaki; Kazuma Matsui, Toyohashi; Toshikuni Miyazaki, Okazaki; Hiroshi Sami, Numazu, and Tatehito Ueda, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 8, 1979, Ser. No. 92,516

Claims priority, application Japan, Nov. 13, 1978, 53-140184

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **4 Claims**



1. In an exhaust-gas-recirculation system for use in a diesel engine having an intake pipe connected to the engine to introduce fluid thereinto and an exhaust pipe connected to the engine to discharge exhaust gas therefrom, said system including an exhaust-gas-recirculation passage having one end thereof connected to said intake pipe and the other end connected to said exhaust pipe, and valve means associated with said exhaust-gas-recirculation passage to control the flow rate of the exhaust gas to be recirculated from said exhaust pipe to said intake pipe through said exhaust-gas-recirculation passage, the improvement which comprises:

a shaft rotatable in synchronization with the engine;

a fly-weight mounted on said shaft to produce a centrifugal force upon the rotation of said shaft;

a governor member movable in response to a thrust acting thereon due to the centrifugal force produced by said fly-weight;

at least one control spring acting against the thrust on said governor menber and having a spring load variable in response to the change in amount of depression of an accelerator pedal; and

actuating means operative in response to the movement of said governor member to actuate said valve means.

4,295,457

CRANKCASE VENTILATING DEVICE FOR RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

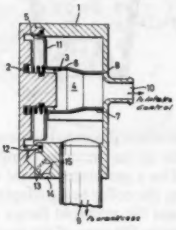
Herbert Schleiermacher, Brühl, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 845,350, Oct. 25, 1977, abandoned. This application Sep. 11, 1979, Ser. No. 74,413

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648112

Int. Cl.³ F02B *25/06*

U.S. Cl. 123—574 **1 Claim**



1. A device for ventilating a crankcase of a reciprocating piston, internal combustion engine by connecting the crankcase to the air intake of the engine, the device comprising:

a housing having a first opening in one wall thereof connected to the crankcase, a downwardly extending second opening communicating with ambient air, and a third opening in a first end wall of the housing connected to the air intake and disposed substantially normal to the first opening;

a piston mounted in the housing, the piston having a cavity therein which faces and surrounds the third opening and which extends normally with respect to the first opening; whereby when the piston reciprocates in a direction normal to the first opening, the third opening is uncovered allowing vapor to flow from the first opening through the housing and out of the third opening;

a projection mounted on a second end wall of the housing opposite the third opening and extending into the cavity of the piston, the projection having a diameter substantially less than the inner diameter of the cavity;

a coil spring surrounding the projection and abutting the piston at one end and the second end wall at the other end for urging the piston to close the third opening;

a first diaphragm disposed between the piston and said one wall of the housing at a location between the first and second openings to seal the first opening from the second opening;

a second diaphragm disposed between the surface of the cavity in the piston and the projection to effect a seal between the second opening and third opening, wherein the first and second diaphragms cooperate with the second end wall to form an ambient air chamber isolated from the first and third openings, the ambient air chamber communicating with the atmosphere via the second opening, whereby when pressure in the housing between the first and third openings exceeds ambient air pressure the piston compresses the coil spring and opens communication between the first and second openings;

a relatively narrow inlet communicating directly with the ambient air chamber and the second opening for throttling ambient air entering the ambient air chamber, and

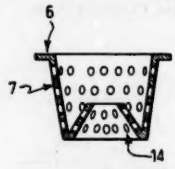
a separating chamber communicating with the narrow inlet and being relatively wide with respect to the narrow inlet, said separating chamber including a downwardly facing screen extending thereacross for filtering out dirt in the ambient air and a downwardly facing outlet through which the ambient air enters and the filtered dirt drops.

4,295,458

DEVICE FOR INCREASING THE UNIFORMITY OF THE AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINES

Albert Pellerin, 35 rue Lambrechts, 92400 Courbevoie, France

Division of Ser. No. 851,971, Nov. 16, 1977, Pat. No. 4,177,780.
This application Jun. 14, 1979, Ser. No. 48,372
Claims priority, application France, Nov. 16, 1976, 76 34414
Int. Cl.³ F02M *29/00*
U.S. Cl. 123—590 **4 Claims**



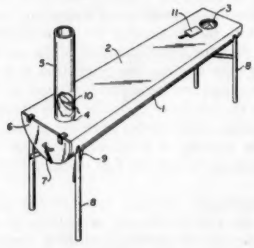
1. In a device for internal combustion engines for increasing the uniformity of the air-fuel mixture, comprising a frusto-conical element formed by a perforated lateral wall having a collar at its major opening, the collar being adapted to fit between the carburetor flange and the manifold flange of an internal combustion engine whereas the apex of the truncated cone extends into the manifold inlet of said engine; the improvement comprising a perforated truncated cone disposed inside said element and having its large base secured to the small base of said element and its small base extending in the direction of the large base of said element but terminating a substantial distance short of said large base of said element, both ends of said truncated cone being open.

4,295,459

STOVE

Charles B. Reedy, Morelia, Mexico, assignor to Benedictine Monks Inc., Benet Lake, Wis.

Filed May 23, 1979, Ser. No. 41,739
Int. Cl.³ F24C *1/00*
U.S. Cl. 126—60 **2 Claims**



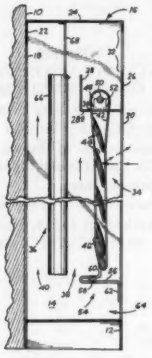
1. A stove consisting essentially of:
1. an elongated shallow, open trough-shaped fuel chamber adapted to be filled from its bottom almost to its top with fuel,
2. a door closing one end of said chamber, said door being openable to permit introduction of fuel,
3. a flat generally rectangular surface member closing the top of the trough-shaped fuel chamber,
4. said flat surface member having a first opening at the door end of the fuel chamber and a second opening at the opposite end of the chamber, said second opening serving as the sole air inlet to the fuel chamber when the stove is in operation,
5. a chimney communicating with said first opening,
6. an adjustable closure member for said second opening to regulate admission of air into said fuel chamber,
7. said stove during operation being completely closed except for the two openings in said flat surface member.

4,295,460

COMBINATION HEAT TRANSFER PANEL AND WALL SHIELD FOR USE WITH STOVES AND OTHER RADIANT HEATERS

Thomas T. Wilson, San Carlos, Calif., assignor to Epoxon Products, Inc., San Carlos, Calif.

Filed Feb. 2, 1979, Ser. No. 9,222
Int. Cl.³ F24B *7/00*
U.S. Cl. 126—121 **3 Claims**



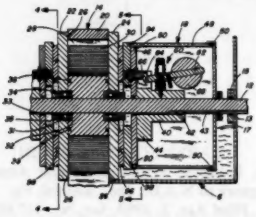
1. A combination heat transfer panel and wall shield for use between a stove type radiant heater and a combustible wall surface, comprising:
(a) a hollow case having a top wall and laterally spaced side walls, the case being arranged for support independently of and spaced from a radiant heater,
(b) a front curtain comprising a plurality of spaced louvers mounted in the case adjacent the open front thereof and spanning the space between the lateral sides thereof, the front louver curtain terminating at its upper end below the top wall of the case and at its lower end above the bottom side of the case,
(c) a rear curtain mounted in the case spaced rearwardly of the front louver curtain and forwardly of the rear side of the case and terminating at its upper end below the top wall of the case and at its lower end above the bottom side of the case,
(d) the space between the front louver curtain and rear curtain defining a first vertical convection chamber and the space between the rear curtain and the rear side of the case defining a second vertical convection chamber,
(e) the space between the bottom side of the case and the lower ends of the first and second curtains defining a cold air inlet communicating the bottom portion of the open front of the case with the bottom ends of the first and second vertical convection chambers,
(f) the space between the top wall of the case and the upper ends of the first and second curtains defining a hot air outlet communicating the top portion of the open front of the case with the top ends of the first and second vertical convection chambers.

4,295,461

FRICTION HEAT GENERATOR APPARATUS

J. Francis Cummings, 35155 Chardon Rd., Willoughby Hills, Ohio 44094, and Alfred O. Werner, 194 Hawthorn Dr., Painesville, Ohio 44077

Filed Dec. 19, 1979, Ser. No. 105,131
Int. Cl.[3] F24C 9/00
U.S. Cl. 126—247 10 Claims



1. A friction heat generator apparatus comprising,
a. an outer housing having a fluid inlet and outlet means,
b. a drive shaft journaled for rotative movement within said housing,
c. a heat exchange means mounted on said drive shaft,
d. said heat exchange means including a heat exchange chamber containing a heat transfer medium communicating with said inlet and outlet means,
e. a non-rotatable conductor plate member attached to said heat exchange means,
f. fly-force-friction drive means mounted for rotation with said drive shaft,
g. said friction drive means including a drive hub member connected to said drive shaft,
h. a friction drive shoe assembly operably mounted for axial movement relative to said drive hub member,
i. a fly-weight mechanism mounted for resilient pivotal movement on said drive hub member, and
j. said fly-weight mechanism including cam means operably connected to said friction drive shoe assembly for frictionally engaging said conductor plate member upon rotation of said drive shaft.

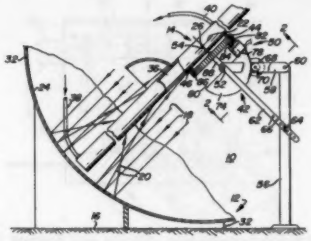
10. A friction heat generator apparatus comprising,
a. an outer hollow housing having fluid inlet and outlet means,
b. a drive shaft journaled for rotative movement within said housing,
c. a heat exchange means mounted on said drive shaft interiorly of said housing,
d. said heat exchange means including a heat exchange chamber containing a heat transfer medium communicating with said inlet and outlet means,
e. a conductor plate member attached to said heat exchange means and said housing for non-rotation relative to said drive shaft,
f. fly-force-friction drive means mounted for rotation with said drive shaft,
g. said friction drive means including a drive hub member connected to said drive shaft,
h. a friction drive shoe member operably mounted for axial movement on said drive hub member,
i. a fly-weight unit mounted for resilient pivotal movement on said drive hub member, and
j. said fly-weight member including cam means operably connected to said friction drive shoe member for frictionally engaging said conductor plate member upon rotation of said drive shaft in response to centrifugal force imparted to said fly-weight unit.

4,295,462

ENERGY CONCENTRATOR SYSTEM

Jesse C. Bunch, 816 Easley St., Silver Spring, Md. 20910

Continuation of Ser. No. 805,867, Jun. 13, 1977, Pat. No. 4,137,902. This application Feb. 5, 1979, Ser. No. 9,358
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—424 11 Claims



1. A radiant energy concentrator system, comprising:
(a) reflector means fixedly secured to a base surface, said reflector means for reflecting incident radiation impinging thereon from an energy source, said reflector means having a geodesic dome type configuration including a plurality of reflective elements of predetermined perimetrical contour, said reflector means having a primary focus;
(b) receiver means having an extended length in a predetermined direction, said extended length being maintained in a direction substantially parallel with said incident radiation; and,
(c) receiver displacement means secured to said receiver means for maintaining said extended length of said receiver means in said parallel direction responsive to directional variations of said incident radiation, said receiver displacement means including means for rotating said receiver means about a pair of substantially mutually perpendicular axes, said mutually perpendicular axes intersecting each other within said extended length of said receiver means, said receiver means extending from at least said axes intersection to said primary focus of said reflector means.

4,295,463

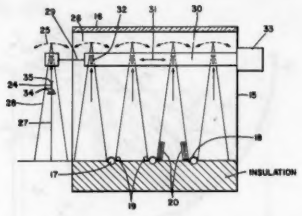
FLEXIBLE V-SHAPED SOLAR TRACKING CONCENTRATING SOLAR ENERGY COLLECTOR

Jeffrey M. Citron, 6111 E. 15th St., Tucson, Ariz. 85711

Continuation-in-part of Ser. No. 680,389, Apr. 26, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 960,121
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—425 3 Claims

1. A tracking solar energy concentrator comprising: a plurality of parallel adjacent solar tracking ridges of inverted V-shape in cross-section, said ridges being spaced to form V-shaped troughs, each of said ridges having an apex axis edge and two base axis edges joined by two sides, support means for supporting each of said ridges at said apex and base axis edges, said sides formed of material having a highly light-reflective

surface facing said troughs, said reflective material being of a flexibe nature to provide for slippage around said support means during tracking orientation, said support means also providing for slippage and pivoting of said reflective material around said support means during tracking orientation, means to provide tension upon said reflective material whereby the shape of said ridges is maintained throughout thermal fluctuations and tracking orientation, driving and guiding means for the simultaneous relative lateral and vertical displacement of each of said apex axis support means with respect to said base axes support means, said driving means and said pivotally mounting means such that the operative axis of the control means shifts with and remains substantially in parallel with the operative axis of the V-shaped troughs throughout tracking orientation.

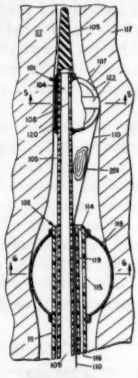


4,295,464

URETERIC STONE EXTRACTOR WITH TWO BALLOONED CATHETERS

Alfred A. Shihata, 3584 Fairlanes Ave., SW., Grandville, Mich. 49418

Filed Mar. 21, 1980, Ser. No. 131,937
Int. Cl.[3] A61B *19/00, 17/00;* **A61M** *25/00, 29/02*
U.S. Cl. 128—1 R **17 Claims**



1. A stone extractor for extracting a ureteral stone arrested within any of various sections of a ureter of a patient wherein said various sections include ureteral sections above the lower third sectional area of said ureter; said stone extractor comprising:

first inflatable means for gradually applying an increasing outward radial force to inner walls of said ureter wherein said inner walls are distended in response to said radial force in a manner such that a stress relaxation state is induced therein;

first catheter means connected to said first inflatable means and adapted to position said first inflatable means below the position of arrestment of said ureteral stone;

second inflatable means for applying a downward force to said ureteral stone to achieve dislodgment of said stone from said inner walls of said ureter;

second catheter means connected to said second inflatable means for positioning said second inflatable means above the position of arrestment of said ureteral stone; and

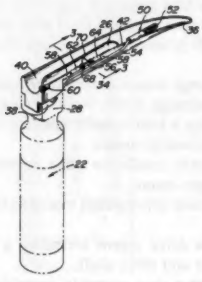
said second catheter means is adapted to adjust the position of said second inflatable means relative to said first inflatable means and is manually manipulable to move said ureteral stone into a spacial area of said ureter distended by said first inflatable means.

4,295,465

LARYNGOSCOPE BLADE

Gabor Racz, Lubbock, Tex., and Forrest Allen, Fayetteville, N.Y., assignors to N.A.D., Inc., Telford, Pa.

Filed Apr. 3, 1980, Ser. No. 137,057
Int. Cl.[3] A61B *1/06*
U.S. Cl. 128—11 **10 Claims**



1. A blade for a laryngoscope having a handle, said blade comprising a base member and a projecting flange member, and bias means, said base member being an elongated member having a rear portion, a midportion and a tip portion, said blade being secured to said handle at said rear portion said midportion being generally linear, said flange projecting upward from said base member along said rear and midportion and being pivotly mounted on said base member, said bias means providing a bias force to said blade, whereupon when said blade is inserted into a patient's mouth with flange in contact with the patient's teeth, said flange is enabled to pivot with respect to said blade against the force provided by said bias means to prevent the application of excess pressure to the teeth.

4,295,466

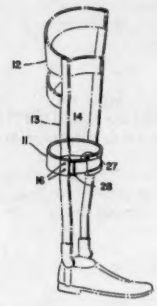
LIMB ENGAGING BAND FOR ORTHOTIC DEVICE

Wesley C. Prout, Los Gastos, Calif., assignor to Hosmer/Dorrance Corporation, Campbell, Calif.

Filed May 16, 1980, Ser. No. 150,646
Int. Cl.[3] A61F *3/00*
U.S. Cl. 128—80 R **8 Claims**

1. A strap assembly for an orthotic device, comprising a form retaining first member including an arcuate configuration to encircle a portion of a limb; a second, flexible, resilient member having a longitudinally extending channel portion, said channel portion engaging and securing said first member;

said first and second members being longitudinally offset to define a free end of each, and strap and buckle means secured



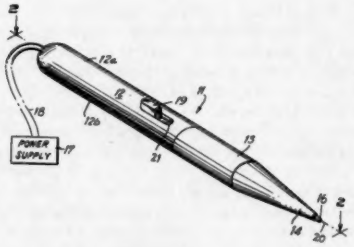
to said free ends to join said free ends together in confronting relationship.

4,295,467

ELECTROLYSIS APPARATUS WITH RETRACTABLE PROBE

Samuel J. Mann, Englewood, and Michael Hrehovcik, Little Falls, both of N.J., assignors to Inverness International Corp., River Edge, N.J.

Filed May 24, 1979, Ser. No. 42,277
Int. Cl.³ A61B *17/38*
U.S. Cl. 128—303.18 **9 Claims**



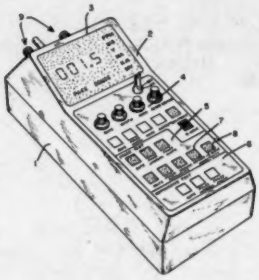
1. An electrolysis apparatus comprising a housing including a probe end, said housing including a conductor means supported on said exterior thereof for defining a current path, an electrically conductive probe adapted to be coordinately displaced between an operative position wherein said probe extends from said probe end of said housing and an inoperative position wherein said probe is retracted into the probe end of said housing, positioning means associated with said housing and said probe for selectively displacing said probe between said operative position and said inoperative position, said positioning means including spring biasing means for biasing said probe against the papilla with a force normally sufficient for entry into a pore but normally insufficient to cause penetration of the skin when said probe is displaced in an operative position, first conductive means electrically connected with said conductor means and second conductive means electrically connected with said probe, said first and second conductive means being electrically connectable with a voltage source.

4,295,468

CARDIAC PACER TESTING SYSTEM

James T. Bartelt, Shoreview, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Oct. 24, 1979, Ser. No. 87,867
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PT **6 Claims**



1. Apparatus for measuring the R-wave sensitivity of a demand cardiac pacer comprising:

(a) means for receiving pacer pulses from said cardiac pacer;

(b) means responsive to successive ones of received pacer pulses for producing pseudo R-waves of incrementally increasing amplitude;

(c) means for applying said pseudo R-wave signals to the R-wave sensing circuit of said cardiac pacer; and

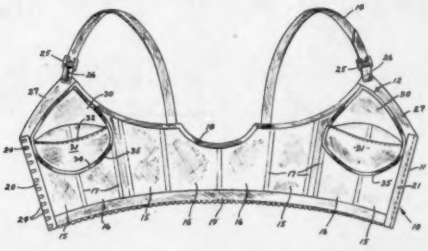
(d) means for displaying the voltage amplitude of the pseudo R-wave just sufficient to cause resetting of the pulse generator of said demand cardiac pacer.

4,295,469

BRASSIERE CONSTRUCTION

Hazelle C. Lindgren, Rte. 4, Box 283A, Buffalo, Minn. 55313

Filed Oct. 20, 1978, Ser. No. 953,273
Int. Cl.³ A41C *3/10, 3/00*
U.S. Cl. 128—480 **3 Claims**



1. A brassiere construction for a brassiere having a latchable, elongated vest member encircling the wearer's body, a pair of breast covering cups with upper and lower edge portions and a pair of shoulder straps, said brassiere construction comprising:

a pair of fabric material elements having upper and lower edges, each said fabric material element being flexibly secured at its lower edge to said brassiere near the lower edge portion of a cup, said material extending upwardly at least to a location for contacting the lower junction of the breast and the lower rib cage,

whereby said fabric material element may pivot about the lower edge inwardly away from the cup to form a pouch within which a breast may be contained, said material

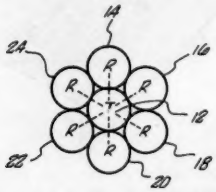
thereby laying between the underside of a breast and the wearer's lower rib cage.

4,295,470

OPTICAL CATHETERS AND METHOD FOR MAKING SAME

Robert F. Shaw, Portola Valley, and John Sperinde, San Jose, both of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.

Continuation of Ser. No. 733,279, Oct. 18, 1976, abandoned. This application Nov. 29, 1978, Ser. No. 964,612
Int. Cl.³ A61B 5/02
U.S. Cl. 128—634 **18 Claims**



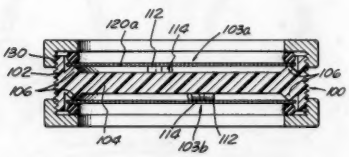
1. A catheter for photometric analysis of a fluid, said catheter comprising a plurality of transmitting and a plurality of receiving optical fibers; each said optical fiber for conducting radiant energy therethrough from an aperture at one end thereof to an aperture at the other end thereof; each aperture of each transmitting and each receiving optical fiber at the distal end thereof having a centroid of area; the centroid of the aperture of the distal end of each and every transmitting optical fiber being equidistant from the centroid of the aperture of the distal end of each and every receiving optical fiber.

4,295,471

NON-INVASIVE VASCULAR WAVEFORM TRANSDUCER AND APPARATUS

William J. Kaspari, 342 Willowbrood Dr., Portola Valley, Calif. 94025

Filed May 25, 1979, Ser. No. 42,415
Int. Cl.³ A61B 5/02
U.S. Cl. 128—675 **11 Claims**



1. A transducer for noninvasively monitoring a vascular waveform comprising

a housing forming two independent cavities therein,

a pair of support members, one disposed in each of said cavities,

a pair of sensing elements, one resting on each of said first support members in said cavities,

a pair of retaining members, one disposed on top of each said sensing element in said cavities,

a pair of retaining caps, each cap having an orifice therethrough, said retaining caps being affixed to said housing to cause each of said sensing elements to be positioned between said support member and said retaining members,

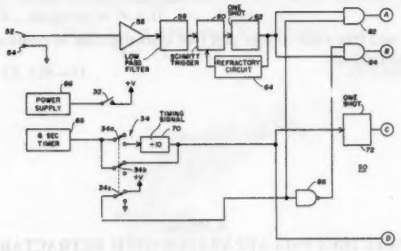
pressure-transmitting means within each of said orifices for causing pressure waves impinging thereupon to be transmitted to the associated sensing element, each sensing element being responsive only to pressure waves entering its associated orifice.

4,295,472

HEART RATE MONITOR

John M. Adams, Mesa, Ariz., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 851,030, Nov. 14, 1977, abandoned, which is a continuation of Ser. No. 714,873, Aug. 16, 1976, abandoned. This application Oct. 1, 1979, Ser. No. 80,597
Int. Cl.³ A61N 5/04
U.S. Cl. 128—690 **4 Claims**



1. A cardiac signal detector comprising:

a housing containing circuitry for detecting and counting individual heartbeats of a person as said heartbeats are manifested by a pair of electric signals, each one of which signals manifests the electrocardiac potential at a different limb of said person, said circuitry including means for selecting the time during which said detected beats are counted to be six or sixty seconds;

a band member of an electrically conductive material selected to be capable of detecting electric signals on the skin of such person, said band being affixed to said housing and said housing and band combination being capable of firmly contacting one of said limbs, said band and housing combination further being in electric communication with said circuitry to provide the signal at said one limb as one of said pair of signals;

receiving means electrically isolated from said housing and band combination, said receiving means being adapted for physical contact with said other limb and being in electrical communication with said circuitry to provide the other one of said pair of signals;

display means for providing a signal representative of the heart rate of said person;

timing means responsive to the state of said means for selecting for providing timing signals to cause said detecting beats to be counted for said selected time;

means responsive to said timing signals and the counted beats for providing signals representative of the heart rate of said person to said display means;

means responsive to said means for selecting whereby in the event a sixty second timing signal is selected, said display means displays the number of detected and counted heartbeats;

and

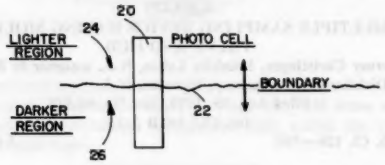
decade means responsive to said means for selecting whereby in the event a six second timing signal is selected, said display means displays ten times the number of detected and counted heartbeats.

4,295,473

APPARATUS AND METHOD FOR ANALYSIS OF MOTION OF A DYNAMIC STRUCTURE

George Diamond, 2408 Wild Oak Dr., Los Angeles, Calif. 90068; James Forrester, 3226 Serra Rd., Malibu, Calif. 90265; Michael Hirsch, 756 Amalfi Dr., Pacific Palisades, Calif. 91272, and Ran Vas, 17130 Clemons Dr., Encino, Calif. 91436

Filed May 24, 1979, Ser. No. 42,247
Int. Cl.[3] D61N *5/00*
U.S. Cl. 178—695 58 Claims



1. A system for detecting and measuring the linear motion in at least one dimension of a portion of either a dynamically movable structure or visual image representations of that structure and providing an analog signal representative of the movement, said system comprising:

(a) sensing means for detecting amd measuring the light change pursuant to a moving boundary on the structure or a series of sequential image representations of that structure moving between dark and light regions on said dynamically movable structure or on said series of sequential visual image representations of said dynamically movable structure, and which sequential visual image representations are displayed in sequence at a rate to represent the movable structure during movement thereof, said sensing means generating a current signal representative of the boundary movement,

(b) conversion means for receiving the current signal from said sensing means for generating an analog voltage signal as a fairly exact analog of the current signal and being representative of and directly related to the amount of movement of said boundary on the dynamically movable structure or on the series of sequential visual image representations,

(c) selection means operatively connected to said conversion means for selecting a sample of predetermined instantaneous amplitude and at least temporarily holding such sample,

(d) detection means operatively connected to said selection means for aiding in and determining a sample of predetermined instantaneous amplitude to thereby determine a maximum limit of movement of the boundary at least in one region, and

(e) means operatively connected to at least said selection means for providing a representation of the amount of movement of said boundary.

4,295,474

RECORDER WITH PATIENT ALARM AND SERVICE REQUEST SYSTEMS SUITABLE FOR USE WITH AUTOMATIC IMPLANTABLE DEFIBRILLATOR

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Oct. 2, 1979, Ser. No. 81,167
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—697 34 Claims

1. A recorder system, adapted for use with an automatic defibrillator system responsive to a patient's electrocardiagram (ECG) data and capable of detecting the occurrence of abnormal cardiac activity and render effective automatically in response thereto to generate and apply one or more defibrillation electrical impulses to the patient's heart intended to return the heart to normal functioning, said recorder system being responsive to the patient's ECG data and comprising, in combination,

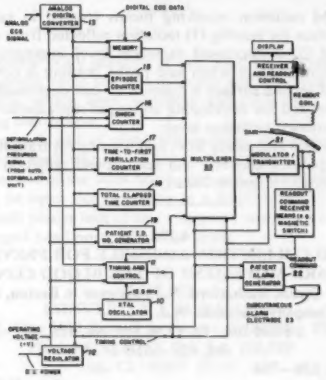
means for sampling and converting said ECG data from analog to digital form,

first and second ECG data digital storage means,

means for registering the occurrence of said abnormal cardiac activity as detected by said automatic defibrillator system,

storage control means controlled by said occurrence registering means responsive to the occurrence of said abnormal cardiac activity for selectively rendering effective said first and second ECG data storage means to store ECG digital data occurring respectively for a first time period just prior to the occurrence of said abnormal cardiac activity or for a second time period encompassing the application of said defibrillation impulse(s) by said automatic defibrillator system,

time registration means controlled by said occurrence registering means responsive to the occurrence of said abnormal cardiac activity for registering as a digital code the time of occurrence of said abnormal cardiac activity,



first counting means responsive to the generation of each defibrillation impulse by said automatic defibrillation system for registering as a digital code a count of the number of said defibrillation electrical impulses generated by said automatic defibrillator system,

second counting means responsive to said occurrence registering means for registering as a digital code a count of the number of occurrences of said abnormal cardiac activity, and

readout control means operable upon command for reading out

(a) the ECG digital data stored in each of said first and second storage means,

(b) the digital code time registration of said time registration means, and

(c) the digital code counts of each of said first and second counting means.

4,295,475

PROBE AND SYSTEM FOR DETECTING PROBE DISLODGEMENT

Terence A. Torzala, Warminster, Pa., assignor to Air Shields, Inc., Hatboro, Pa.

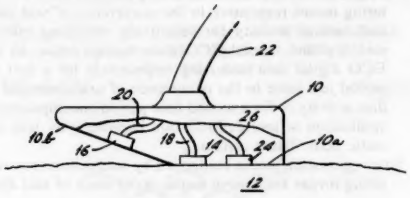
Filed Oct. 26, 1979, Ser. No. 88,474
Int. Cl.[3] A61B *5/00*
U.S. Cl. 128—736 13 Claims

1. A probe comprising:

a probe housing having a contact surface adapted for contact with a body and a second surface adapted to be spaced from said body and upon which radiation reflected from

said body impinges when said contact surface is in contact with said body;

first radiation receiving means located in said contact surface for sensing an increased radiation level impinging on said contact surface when said probe housing is dislodged from said body and said contact surface is exposed to said increased radiation level and for developing an output representative of said increased radiation level;



second radiation receiving means located in said second surface for sensing (1) radiation reflected from said body, and (2) a decreased radiation level impinging on said second surface when said probe housing is covered and said second surface is exposed to said decreased radiation level and for developing an output representative of said decreased radiation level;

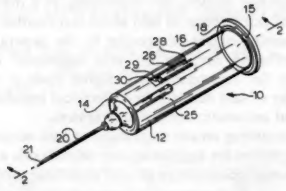
and means emanating from said housing for transmitting said outputs of said first and said second radiation receiving means to a remote location.

4,295,476

BLOOD COLLECTION ASSEMBLY FOR PREVENTING OUTWARD MOVEMENT OF THE BLOOD CONTAINER

Gary F. Quaas, Rutherford, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Dec. 19, 1979, Ser. No. 105,346
Int. Cl.[3] A61B 5/14
U.S. Cl. 128—764 **7 Claims**



1. A holder assembly for use with a closed blood collection container one end of which includes a cannula-penetrable closure with a lip element associated therewith, said assembly comprising:

a receptacle having a closed end, side walls and an open end for the receipt of said blood collection container;

an interior cannula extending from said closed end into said receptacle;

an exterior cannula extending outwardly from said closed end, said interior and said exterior cannulae being in fluid communication with each other;

a spring-resilient, cannula-penetrable valve sheath covering said interior cannula adapted to expose said interior cannula to fluid flow therethrough when said blood collection container is inserted into said receptacle thereby causing said interior cannula to penetrate said closure and said sheath to become compressed against said closed end, said sheath serving as a loaded spring when compressed; and

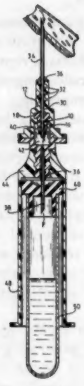
said receptacle including a spring-depressible tongue located in a side wall thereof and being normally flush with the side wall and having a distal end depressible downwardly into the interior of said receptacle and a proximal end hingedly connected to said side wall, said distal end of said tongue being spaced a pre-determined distance from the closed end of said receptacle so that it, upon being downwardly depressed, is adapted to engage said lip element on said blood collection container after being inserted into said receptacle to thereby prevent said container from being pushed out of said receptacle under the influence of the spring force of said compressed valve sheath.

4,295,477

MULTIPLE SAMPLING DEVICE HAVING MOLDED VALVE AND HUB

Werner Christinger, Franklin Lakes, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Aug. 15, 1979, Ser. No. 66,818
Int. Cl.[3] A61B 5/14
U.S. Cl. 128—766 **5 Claims**



1. A multiple blood sampling device adapted to be coupled with an evacuated container to obtain blood samples from a patient, said device comprising a housing having a first hub, a second hub and chamber therein, a first cannula attached to said first hub and adapted for penetrating a blood vessel, a second cannula attached to said second hub and adapted for piercing a stopper of an evacuated collection container, and a one-way valve provided within said housing, said cannulas and said chamber being in fluid communication when said valve is in an open position, characterized in that a first portion of said valve is connected in fixed position to said first hub, and a second portion of said valve freely extends into the chamber, said second portion capable of assuming an open position to allow the passage of blood therethrough when suction is applied within the chamber by means of the second cannula, and assuming a closed position when pressures within each cannula are equal, said valve positioned inside said first hub and said chamber to be free of contact with said second hub in both open and closed conditions.

4,295,478

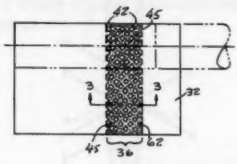
COMPOSITE TIPPING STRUCTURE FOR USE ON AN AIR-VENTILATED CIGARETTE AND METHOD OF MANUFACTURING SAME

Roy E. Yeatts, Winston-Salem, N.C., assignor to RJR Archer, Inc., Winston-Salem, N.C.

Filed Apr. 11, 1979, Ser. No. 29,163
Int. Cl.[3] A24C 5/56; A24D 3/00, 3/18
U.S. Cl. 131—336 **9 Claims**

1. A composite structure for use as a tipping material for an air-ventilated smoking product comprising a non-porous paper

web, a heat activatable adhesive coating on said non-porous paper web in a pattern including a zone having a width corresponding to a fraction of the length of said non-porous paper



web and intermediate two marginal areas, said zone having a plurality of intermingled discrete coated and void areas, and microscopic perforations interspersed only within the void areas in said zone.

4,295,479

METHOD AND DEVICE FOR MANUFACTURING CIGARS

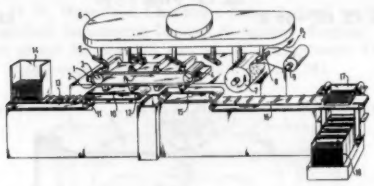
Wilhelmus P. L. Boogers, Eindhoven, Netherlands, assignor to B.V. Arenco P.M.B., Best, Netherlands

Filed Nov. 29, 1978, Ser. No. 964,455

Claims priority, application Netherlands, Dec. 29, 1977, 7714544

Int. Cl.[3] **A24D** *1/02;* **A24C** *1/26, 1/30*

U.S. Cl. 131—60 **12 Claims**



2. A device for wrapping cigar filler material with a tobacco wrapper portion comprising at least two filler holders for receiving each one filler, and at least one wrapper portion carrier means for applying each tobacco wrapper portion in the stretched state to a filler characterized by a feeding conveyor (**13**) for feeding fillers from a stock to an adjoining transfer station (**10**), by a delivery station (**15**) arranged at a distance from the latter and by an advancing mechanism for carrying the filler holders (**1**) from the transfer station (**10**) to the delivery station (**15**) and conversely as well as by a guide path with a driving mechanism for advancing at least one wrapper portion carrier means in synchronism with the holders (**1**).

4,295,480

COMB AND THE METHOD OF MAKING SAME

John A. Biela, Niles, Ill., assignor to Jerome D. Schiffman, deceased, late of Wilmette, Ill.

Filed Jan. 27, 1977, Ser. No. 763,280

Int. Cl.[3] **A45D** *24/00*

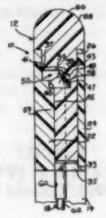
U.S. Cl. 132—151 **4 Claims**

1. A comb, comprising:

an elongated hollow frame having front and rear walls and fixed end members for defining a hollow interior in said frame, said hollow interior having an elongated opening at the bottom thereof;

elongated means being disposed at least partially within said hollow interior in overlying engagement with the inside surface of said front and rear walls for closing the bottom opening in said frame and having a series of spaced-apart transversely extending openings;

a series of axially rotatable rod-like teeth having enlarged head and cylindrical body portions and disposed individually with their body portions within said openings and extending from said elongated means out of said hollow interior through the bottom opening thereof, said teeth receiving openings in said elongated means being larger in cross-sectional area than the cross-sectional area of said



cylindrical body portions of said teeth so that said shank cylindrical body portions adjacent said head portions fit entirely within their openings and said head portions fitting thereabove,

wherein each one of said teeth includes an enlarged head portion, each opening is a four-sided slot in cross-sectional shape, one of the sides being open and in the plane of said face, an open slot extending in a lengthwise direction in one side planar face of said elongated means for receiving enlarged head portions of said teeth.

4,295,481

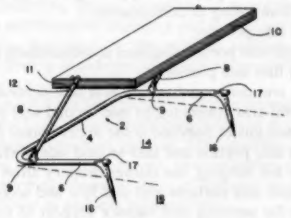
CONVERTIBLE SUN SHADE

Charles E. Gee, 1481 Russell Dr. N., St. Petersburg, Fla. 33710

Filed Jul. 18, 1977, Ser. No. 816,339

Int. Cl.[3] **E04F** *10/10*

U.S. Cl. 135—5 R **11 Claims**



1. A self-supporting sun shade, comprising:

a U-shaped support member having the bottom portion of the U as a rearward support for the shade and the legs of the U being forwardly positioned;

a pair of upright support members, one pivotally mounted on each of said legs of said U-shaped member, proximate to said bottom portion of the U;

a canopy pivotally mounted between said upright support members, on the upper ends thereof, for shielding sunlight from the region between said legs of said U-shaped member;

said pivotal mounting for said canopy to said upright support member, further comprising:

said upright support member being a hollow tubular structure;

a shaft rigidly mounted to said canopy and passing through a hole in the side of said upright support member;

a substantially U-shaped, resilient clamping member within

said hollow tubular structure at the upper end of, having two legs, one on each side of said shaft;

a screw passing through the side of said upright support member and through a first one of said legs of said clamp and threadably engaging a second one of said legs of said clamp, for tightening said clamp about said shaft;

a cap sealably engaging said upper end of said hollow tubular structure for protecting said clamping member from environmental elements;

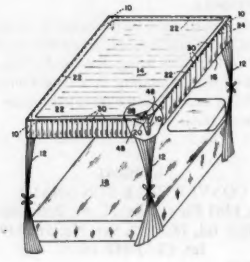
whereby said canopy can be locked into a fixed position with respect to said upright support member.

4,295,482

VALANCE SUPPORT

Harold F. McMullen, 5009 E. Colonial Dr., Apt. 14, Tampa, Fla. 33611

Filed Mar. 31, 1980, Ser. No. 135,773
Int. Cl.³ A45F *3/52*; A47C *29/00*
U.S. Cl. 135—8 **11 Claims**



1. A valance support for supporting a corner drapery from a ceiling, comprising in combination:

a first side portion;

a second side portion disposed at substantially right angles to said first side portion;

a first arm connected to said first side portion;

a second arm connected to said second side portion;

a valance gusset disposed in the upper corner formed by said first side portion and said second side portion;

means for hanging the corner drapery from said first and second side portions and said first and second arms; and

means for securing said valance support to the ceiling.

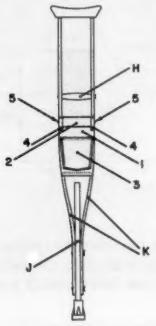
4,295,483

CRUTCH-MOUNTED ACCESSORY POUCH

Samuel W. Smith, P.O. Box 317, Anthony, Fla. 32617

Filed Dec. 26, 1979, Ser. No. 106,007
Int. Cl.³ A61H *3/02*
U.S. Cl. 135—66 **2 Claims**

1. In combination a pouch means and a Y-type crutch having two separate upright side members, with said pouch means comprising a fabric envelope body means fitting around a central portion of said crutch means, and with said pouch means comprising a fitted bottom closure means extending the width of the lower portion of said pouch means and the distance between the said upright side members of the said crutch means, and said pouch means comprising a central cavity within said side member means of said crutch means and said



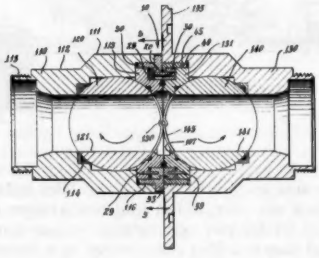
fabric envelope body means whereby small articles may be transported therewithin without loss.

4,295,484

FRANGIBLE CONNECTOR FOR SELF-CLOSING BREAKAWAY VALVE ASSEMBLIES OR SIMILAR STRUCTURES

Daniel T. Meisenheimer, Jr., 404 Longmeadow Rd., Orange, Conn. 06477

Filed Aug. 22, 1980, Ser. No. 181,386
Int. Cl.³ F16K *17/40*
U.S. Cl. 137—68 R **11 Claims**



1. A frangible connector for frangibly connecting the first and second housings of a self-closing breakaway valve assembly or the like, the frangible connector comprising:

(A) a first clamping ring and a second clamping ring secured together by frangible means, the first and second clamping rings together defining a radially outwardly opening peripheral channel;

(B) A first attachment sleeve received over the first clamping ring and having an inturned flange received in the radially outwardly opening peripheral channel, the first attachment sleeve being adapted for attachment to the first housing of the self-closing breakaway valve assembly; and

(C) a second flanged attachment sleeve received over the second clamping ring and having an inturned flange received in the radially outwardly opening peripheral channel and a radially outwardly protruding flange, whereby the flanged attachment sleeve is free for rotation relative to the clamping rings and the first attachment sleeve, the flanged attachment sleeve being threaded for attachment to the second housing of the self-closing breakaway assembly;

whereby the clamping rings capture and clamp the attachment sleeves together and the flanged attachment sleeve may be

rotated by means of its radially protruding flange to thread it into the second housing of the self-closing breakaway valve assembly, thereby drawing the second housing into assembled relationship with the first housing without rotating the first housing so that a desired angular orientation between the first and second housings may be established.

4,295,485

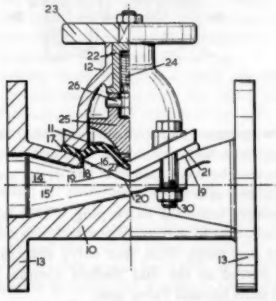
DIAPHRAGM VALVE

Timothy O. W. Waterfield, Chandler's Ford, England, assignor to Waterfield Engineering Limited, Hampshire, England

Division of Ser. No. 900,393, Apr. 26, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,791

Int. Cl.³ F16K *7/16*

U.S. Cl. 137—74 **7 Claims**



1. A diaphragm valve comprising a body traversed by a fluid passageway and having an opening in communication with the fluid passageway, a diaphragm for controlling fluid flow through the passageway and extending across the opening, a valve-operating mechanism including a spindle, a compressing member secured to the diaphragm and axially movably connected to the spindle, the compressing member being movable by the valve-operating mechanism at right angles to the passageway to control opening of the passageway through the intermediary of the diaphram, resilient means between the spindle and the compressing member to urge the compressing member axially of the spindle into sealing contact with the valve body if the diaphragm is destroyed, and a bonnet secured to the body to house the valve operating mechanism and with a peripheral portion of the diaphragm being clamped between the bonnet and body.

4,295,486

LOW COST, DIFFUSER CONCEALABLE, VOLUME CONTROL, HEAT RESPONSIVE, RESETTABLE, BUTTERFLY DAMPER OPERATOR

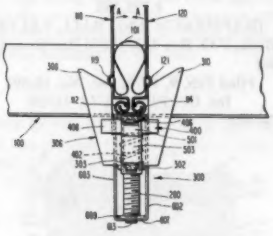
Francis J. McCabe, Doylestown, Pa., assignor to Prefco Products, Inc., Buckingham, Pa.

Continuation-in-part of Ser. No. 900,620, Apr. 27, 1978, Pat. No. 4,263,930, which is a continuation-in-part of Ser. No. 896,299, Apr. 14, 1978, Pat. No. 4,195,384, Ser. No. 896,237, Apr. 14, 1978, Pat. No. 4,219,041, Ser. No. 792,525, May 2, 1977, Pat. No. 4,146,048, and Ser. No. 764,774, Feb. 2, 1977, Pat. No. 4,113,230, which is a continuation of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173, said Ser. No. 896,299, is a continuation-in-part of Ser. No. 779,044, Mar. 18, 1977, Pat. No. 4,099,292, which is a continuation-in-part of Ser. No. 676,483, Apr. 13, 1976, Pat. No. 4,041,570, and Ser. No. 676,413, Apr. 13, 1976, Pat. No. 4,040,304. This application Sep. 21, 1979, Ser. No. 77,583

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.³ F16K *17/38*

U.S. Cl. 137—80 **30 Claims**



1. A damper operator for use with a damper having a frame and at least one blade, said blade being movable between open and closed positions with respect to said frame, said operator comprising:

(a) at least one pawl member associated with said frame;

(b) blade positioning means mounted for movement with respect to said frame for engaging said at least one blade of establishing, according to the relative position of said blade positioning means, the relative position of that blade with respect to said frame; and

(c) heat responsive means connected during normal conditions between said blade positioning means in at least one of said relative positions and said pawl member, for disconnecting from between said pawl member and said blade positioning means at least in response to a preselected increase in ambient temperatures.

4,295,487

CLEANOUT APPARATUS FOR FLOW CONTROL VALVES

Robert M. Purton, Cerritos, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 1, 1979, Ser. No. 90,232

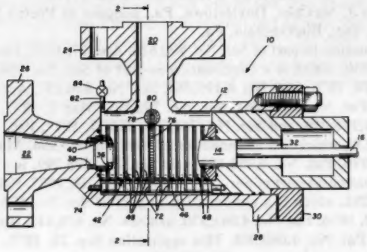
Int. Cl.³ F16K *51/00, 47/00*

U.S. Cl. 137—242 **5 Claims**

1. Cleanout apparatus for a valve or the like that includes a hollow body having an inlet and an outlet, orifice means located in the body between the inlet and outlet, and a valve member operable to permit or prevent flow through the body and orifice means from the inlet to the outlet, said apparatus comprising:

a flow path through the orifice means including an annular orifice in the outer periphery of the orifice means;

a cleanout member mounted on the body and extending into a portion of said annular orifice; and,



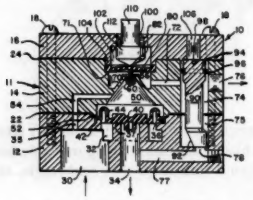
means for rotating the orifice means whereby said cleanout member can traverse the full length of said annular orifice to dislodge any debri collected in said annular orifice.

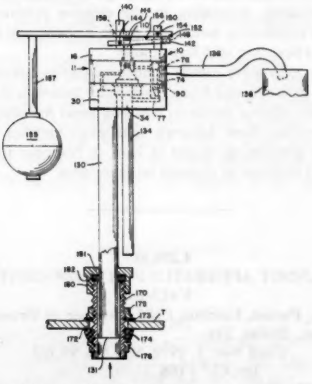
4,295,488

DIAPHRAGM AND BALL VALVE

Harold M. Book, P.O. Box 323, 15876 Beechwood Rd., Findlay, Ohio 45840

Filed Feb. 9, 1979, Ser. No. 10,692
Int. Cl.³ F16K *31/18, 33/00*
U.S. Cl. 137—414 **28 Claims**





1. A liquid flow valve comprising:

(A) an adjacent inlet and outlet,

(B) a diaphragm for simultaneously opening and closing said adjacent inlet and outlet on one side of said diaphragm,

(C) a substantially conical chamber on the other side of said diaphragm having an inlet duct continuously open at all times to said adjacent inlet regardless of the opening and closing of said adjacent inlet and outlet of said diaphragm, said open inlet duct normally pressurizing said chamber for causing said diaphragm to close said adjacent inlet and outlet, said chamber having a valved outlet at its apex,

(D) a freely movable ball in said chamber movable by the flow of the liquid through said conical chamber for directing and maintaining said freely movable ball adjacent said apex of said conical chamber at all times and for normally closing said valved outlet from said chamber when not obstructed by external means, and

(E) external means for moving said ball from said valved outlet to reduce the pressure in said conical chamber from said inlet duct to permit said diaphragm to be moved by said adjacent inlet pressure to open said valve by opening said adjacent inlet and outlet.

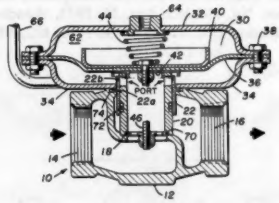
6. A valve according to claim **1** wherein said external means comprises a float and lever mechanism.

4,295,489

PILOT-OPERATED BACK PRESSURE REGULATOR

Roger R. Arends; Wayne B. Bailey, both of Marshalltown; John W. Duffy, Tama, and Brice D. Springer, Marshalltown, all of Iowa, assignors to Fisher Controls Company, Inc., Marshalltown, Iowa

Filed Oct. 3, 1979, Ser. No. 81,587
Int. Cl.³ F16K *31/365*
U.S. Cl. 137—488 **2 Claims**



1. A pilot-operated back pressure regulator comprising:

(a) A regulator body having an inlet and an outlet, a valve seat located between said inlet and outlet and a valve plug guide above said valve seat;

(b) a pressure balanced valve plug within said valve plug guide adjacent to said valve seat and movable reciprocally toward and away from said valve seat, said valve plug being ported at the end thereof remote from the end which seats on said valve seat;

(c) an actuator having a flexible diaphragm forming a spring cavity and a lower cavity within said actuator, said spring cavity containing a spring for closing said valve plug against said valve seat and said lower cavity accepting said ported portion of said valve plug;

(d) said valve plug being directly attached to said diaphragm such tht flexure of said diaphragm operates said valve plug to open or close said back pressure regulator by moving said valve plug away from or toward, respectively, said valve seat;

(e) a plurality of bolts securing said actuator to said regulator body whereby removal of said plurality of bolts allows simultaneous removal of said actuator and said valve plug from said regulator body; and

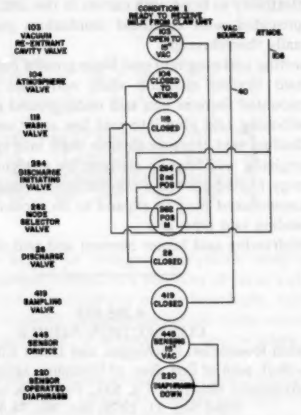
(f) a pilot valve in communication with the inlet pressure, with said spring cavity, and with an exhaust whereby said pilot valve operates said actuator.

4,295,490

MILKING APPARATUS

Archie E. Boudreau, P.O. Box 1125, Modesto, Calif. 95353

Division of Ser. No. 906,425, May 16, 1978, Pat. No. 4,198,999.
This application Aug. 9, 1979, Ser. No. 65,172
Int. Cl.³ F16K *11/10*
U.S. Cl. 137—595 **14 Claims**



1. A vacuum control valve system including:

a valve system body which defines a first vacuum conduit communicating with a source of vacuum, and a first atmospheric conduit communicating with the atmosphere;

said valve system body further defining a second vacuum conduit and a second atmospheric conduit;

said first and second vacuum conduits defined by said body being out of fluid communication with said first and second atmospheric conduits defined by said body;

a first valve means for selectively providing communication between the first and second vacuum conduits;

a second valve means for selectively providing communication between the first and second atmospheric conduits;

a third valve means;

said valve system body defining a third vacuum conduit provided in communication with the third valve means and communicating with the source of vacuum and a third atmospheric conduit provided in communication with the third valve means and communicating with the atmosphere;

a fourth conduit for providing communication between the third valve means and the first valve means and a fifth conduit for providing communication between the third valve means and the second valve means;

wherein the third valve means has a first mode for providing communication between the fourth conduit and the third atmospheric conduit and between the fifth conduit and the third vacuum conduit; and

wherein the third valve means has a second mode for providing communication between the fourth conduit and the third vacuum conduit, and between the fifth conduit and the third atmospheric conduit.

4,295,491

DOUBLE ANGLED-DISC DIVERTER VALVE OR THE LIKE

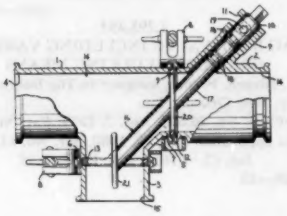
Tod R. Galloway, Menasha, Wis., assignor to Fox Valley Process Systems & Supply, Inc., Menasha, Wis.

Filed May 15, 1980, Ser. No. 150,085
Int. Cl.³ F16K *11/02*
U.S. Cl. 137—625.46 **5 Claims**

1. A double angled-disc valve comprising:

a valve body defining a a substantially straight through passage and a substantially straight branch passage substantially perpendicular to the through passage:

a single valve stem at least partially within the valve body, said valve stem having a longitudinal axis at substantially a 45S° angle relative to both passages and being reciprocally rotatable about its longitudinal axis;



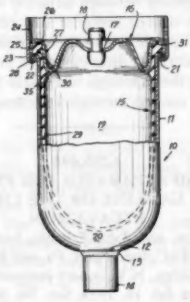
and a pair of valve discs fixed to the valve stem at angles of substantially 45° relative to the longitudinal axis of the stem, each disc being disposed in a respective one of the passages and being actuable between parallel open and perpendicular closed positions with respect thereto, rotation of the valve stem about its longitudinal axis causing simultaneous actuation of the discs.

4,295,492

LOW COST ACCUMULATOR DEVICE

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Incorporated, Chatsworth, Calif.

Filed Nov. 13, 1979, Ser. No. 93,624
Int. Cl.³ F16L *55/04*
U.S. Cl. 138—30 **4 Claims**



1. An accumulator device including a pressure vessel having an oil port at one end, and a gas charging port at the other end, and a resilient elastomeric bladder therein and dividing the same into two chambers in communication, respectively, with said oil and said gas ports, said pressure vessel being of a two part construction and comprising a generally cylindrical shell having a closed end carrying said oil port and having an open mouth portion, an upwardly directed annular trough member surrounding said mouth portion, said trough including a floor, a cylindrical skirt surrounding said trough, a circular cap member carrying said gas charging port mounted in said open mouth portion of said shell, said cap member including a downwardly facing surrounding annular trough member having a depending peripheral annular lip, said cylindrical skirt being spun inwardly over the trough defining portions of said cap member whereby said annular lip of said cap is biased into engagement with said floor of said upwardly directed trough member, said trough members together defining an annular chamber having an annular opening directed toward the inte-

rior of said vessel, said bladder assembly including a thickened rim portion maintained in compressed condition within said annular chamber and providing a seal between said cap and the open mouth portion of said shell, said bladder having side wall portions extending through said annular opening into the interior of said shell.

4,295,493

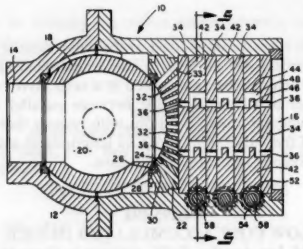
DRAG BALL VALVE INCLUDING VARIABLE PRESSURE REDUCING MEANS

Roger Bey, Illzach, France, assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 26,625, Apr. 2, 1979, Pat. No. 4,271,866. This application Jan. 18, 1980, Ser. No. 113,148

Int. Cl.³ F16K *5/06*; F15D *1/02*

U.S. Cl. 138—43 **1 Claim**



1. A variable fluid pressure reducing device comprising a plurality of fixed disks having apertures therein and a plurality of rotatable disks having apertures therein with means for diverting fluid passing therethrough, each of said rotatable disks being interposed between adjacent fixed disks, said diverting means in one or more of said rotatable disks being aligned with said apertures in said fixed disks adjacent said one or more of said rotatable disks causing a pressure reduction in said fluid passing therethrough when said one or more of said rotatable disks is rotated through a predetermined angle.

4,295,494

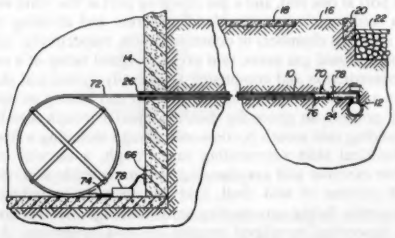
METHOD AND APPARATUS FOR PLUGGING AND CUTTING A GAS LINE OR THE LIKE WITHOUT EXCAVATION

John B. McGowan, and John Trimble, both of Malvern, Pa., assignors to UMAC, Inc., Paoli, Pa. and Brooklyn Union Gas Company, Brooklyn, N.Y., a part interest to each

Filed Jul. 16, 1979, Ser. No. 57,626

Int. Cl.³ B22D *19/10*

U.S. Cl. 138—89 **13 Claims**



1. A method of sealing an underground pipeline or the like at or near the point where it connects to a main without excavation to obtain access to the pipe, comprising the steps of:

obtaining access to the underground pipe at a point beyond where it exits the earth:

mounting a thermally stabilized cross-linked preshrunk plug on a heater element, said heater element being mounted on a flexible elongate shaft having a diameter less than the diameter of the pipe, said shaft having sufficient rigidity to push said heating element through said line and sufficient flexibility to bend with curves in the line, said shaft being provided with electrical conductors passing longitudinally therethrough;

inserting said plug into said underground pipeline by feeding said flexible elongate shaft with said heater element mounted thereon into said underground pipeline;

positioning said plug into said line at or near said main by feeding said elongate flexible shaft into said line;

energizing said heating element by applying electrical energy to said electrical conductors causing said preshrunk cross-linked plug to expand to its cross-linked condition sealing said pipe; and

withdrawing said heater element and said shaft.

4,295,495

CONNECTION NIPPLE

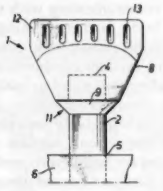
Friedrich Rosemeier, Hechingen, and Horst Killmaier, Hechingen-Boll, both of Fed. Rep. of Germany, assignors to Gambro Dialysatoren GmbH & Co. KG., Fed. Rep. of Germany

Filed Sep. 11, 1979, Ser. No. 74,499

Claims priority, application Sweden, Sep. 13, 1978, 7809625

Int. Cl.³ F16L *55/10*

U.S. Cl. 138—89 **29 Claims**



1. A connection nipple for providing fluid communication with the interior of a container, the connection nipple comprising:

a hollow member having a first open end and a second open end, the first open end being adapted to be sealingly disposed in fluid communication with the interior of the container, and the second open end being disposed exteriorly of the container;

a circumferential rib member interally disposed about the circumference of said hollow member, said rib member having a cross-sectional shape which tapers to substantially a point to define a connection line about the circumference of said hollow member, said connection line being axially spaced from said secord open end of said hollow member;

a releasable sealing member integrally connected to said rib member in proximity to said connection line and sealingly surrounding said second open end of said hollow member to completely enclose and seal said second open end;

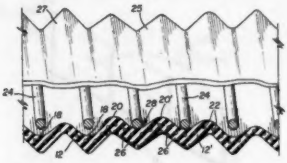
said releasable sealing member being disconnectable from said hollow member to provide access to said second open end by breaking said releasable sealing member substantially along said connection line; and

said circumferential rib member extending laterally outward from the surface of said hollow member a distance sufficient so as to provide a support surface for a finger grip when said releasable sealing member is to be disconnected from said hollow member and thereafter.

4,295,496
HOSE WITH INTERNAL INSERT MEMBER

Guy T. Bixby, Longmont, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Feb. 19, 1980, Ser. No. 122,784
Int. Cl.³ F16L 11/00, 9/00
U.S. Cl. 138—122 25 Claims



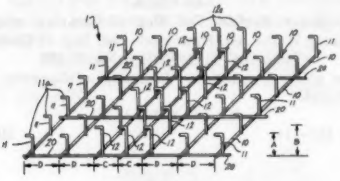
1. In a hose having an elongated polymeric body and a coiled insert member formed of a plurality of turns and positioned in the internal passageway of the hose body, said hose body having a tendency to swell during use under conditions of elevated temperature or pressure, the improvement comprising:

a filamentary annular band integral with the polymeric body and which extends generally circumferentially of the body, having filaments resistant to expansion at elevated temperature or pressure, the band having a width substantially less than that of the hose body and being positioned between at least two adjacent turns of the coiled insert member.

4,295,497
VARIEGATED STIRRUP MAT

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Filed May 4, 1979, Ser. No. 36,170
Int. Cl.³ F16L 55/00; B21F 27/20
U.S. Cl. 138—175 13 Claims

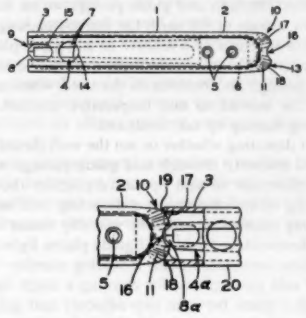


1. A concrete pipe comprising at least one cylindrical steel wire reinforcing cage, and concrete surrounding said cage, said cage including an additional reinforcing stirrup mat located in the area of the crown thereof and another located in the area of the invert thereof, each of said mats having lateral edges and a lateral center area and wherein stirrup projections project from each mat, said mats being defined by a network of interconnected wires, the improvement in said concrete pipe comprising: said cylindrical reinforcing cage being elliptical in lateral cross section and said stirrup projections being formed from steel and being taller in the lateral center area of said mat than towards the lateral edges thereof so as to concentrate more steel in the lateral center area of the mat than towards the lateral edges of the mat.

4,295,498
GRIPPER SHUTTLES

Charles D. Davis, Charlotte, N.C., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Apr. 28, 1980, Ser. No. 144,418
Int. Cl.³ D03J 5/06
U.S. Cl. 139—196.2 3 Claims

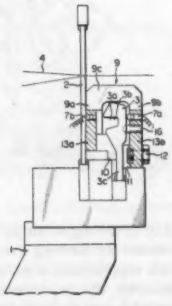


1. In a gripper shuttle for picking weft threads in a weaving machine, said shuttle comprising a tubular housing substantially oblong in transverse cross-section and having a closed front end and an open trailing end, a gripper clamp mounted within said housing and having means positioned even with or in close proximity to the opening in the trailing end of said housing for gripping a weft thread, the improvement comprising a nose on said housing having an arcuate front end edge surface with a centrally located recess therein, said recess being so dimensioned as to preclude contact between the front end edge surface of said shuttle and the weft thread gripping means of a similar shuttle when the front and rear ends of the shuttles contact each other in the same plane.

4,295,499
DETECTION OF WEFT IN SHUTTLELESS LOOM

Hajime Suzuki, Anjyo, and Yoshimi Iwano, Ohbu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 5, 1979, Ser. No. 100,408
Claims priority, application Japan, Dec. 12, 1978, 53-152671; Dec. 12, 1978, 53-169878; Dec. 12, 1978, 53-169879
Int. Cl.³ D03D 51/34
U.S. Cl. 139—370.2 8 Claims



1. A shuttleless loom comprising:

a reed;

a plurality of guide plates arranged in spaced relationship

along said reed, said guide plates having aligned apertures forming a weft guide passage through which a weft thread is passed, said apertures of said guide plates including upper wall surfaces aligned in a plane;

slay means supporting said reed and said guide plates and mounted for pivotal movement for moving said guide plates from an operative position, whereat said guide plates are within a shed of warp threads and a weft thread is inserted through said guide passage, to an inoperative position outside of the shed, for thereby causing the weft thread to slide in a path realtive to said guide plates along said upper wall surfaces until the weft thread leaves said guide passage and remains in the shed when said guide plates are moved to said inoperative position, and for allowing beating by said reed; and

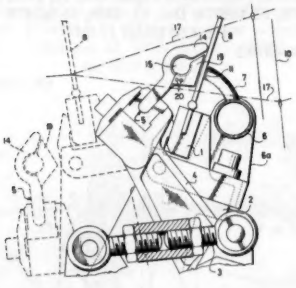
means for detecting whether or not the weft thread has been inserted properly through said guide passage when said guide plates are in said operative position thereof, said detecting means comprising a detecting unit including a mounting member mounted on said slay means for movement therewith and with said guide plates, light transmitter means, mounted on said mounting member on a first side of said guide plates, for emitting a single light beam through a space between two adjacent said guide plates along a path in or above said plane of said aligned upper wall surfaces of said apertures in said guide plates, such that during movement of said guide plates from said operative position to said inoperative position said light beam intersects said path of the weft thread when the weft thread leaves said guide passage and when the weft thread is properly inserted through said guide passage, and light receiver means, mounted on said mounting member on a second side, opposite said first side, of said guide plates, for receiving said single light beam from said light transmitter means.

4,295,500

METHOD OF AND A DEVICE FOR FORMING AN ADDITIONAL STREAM OF AIR IN A GUIDE COMB OF AN AIR JET LOOM

Vladimir Svaty, Liberec, Czechoslovakia, assignor to Zbrojovka Vsetin, Vsetin, Czechoslovakia

Filed Dec. 17, 1979, Ser. No. 104,393
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **2 Claims**



1. In the method of operating an air jet loom having a guide comb, a reed, and means for forming a weft inserting supporting air stream which supplements a main weft supporting air stream in the guide comb, the improvement comprising

directing a stream of air via at least one nozzle through said reed; and

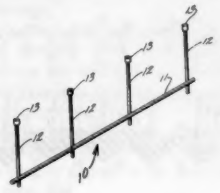
deflecting said stream of air to thereby direct it into the weft inserting direction in said guide comb.

4,295,501

SPACER BAR AND RELATED METHOD FOR CONCRETE PIPE MANUFACTURE

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Filed Jul. 11, 1979, Ser. No. 56,602
Int. Cl.³ B21F *3/00*
U.S. Cl. 140—92.1 **25 Claims**



1. A method for spacing a generally cylindrical reinforcing wire cage from a concrete pipe form, said cage including generally circumferentially oriented wire reinforcement and generally longitudinally oriented wire reinforcement, said method comprising the steps of:

providing a plurality of spacer bars, each spacer bar having a tie rod and a plurality of links joined to and spaced along the length of said tie rod generally parallel to one another;

positioning said links along said tie rod;

securing said spacer bars to said cage at spaced points around the circumference thereof with said links projecting generally radially therefrom;

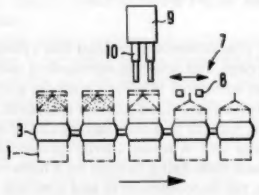
locating said cage within said pipe form with said links of said spacer bars engaging said form to hold said cage in properly spaced relationship with respect to said pipe form.

4,295,502

METHOD AND APPARATUS FOR THE ELIMINATION OF FOAM ABOVE THE LEVEL OF A LIQUID, AND PARTICULARLY ABOVE A PACKAGED LIQUID SUCH AS MILK

Erwin Matzner, Krefeld, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 23, 1979, Ser. No. 87,358
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926955
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—11 **20 Claims**



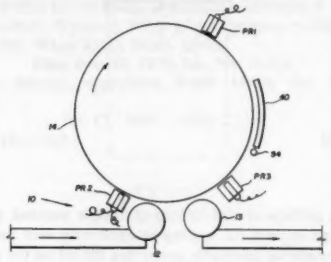
1. A method for the elimination of foam above the level of a liquid in a container comprising collapsing the foam by applying ultrasonic waves to the foam indirectly through the ambient atmosphere.

4,295,503

AUTOMATIC GLASS FRAGMENTATION DECONTAMINATING SYSTEM FOR GLASS CONTAINERS

Alfred J. Gilmour, Waterloo, Canada, assignor to Auto-Flush Systems Ltd., Waterloo, Canada

Filed Dec. 12, 1979, Ser. No. 102,691
Claims priority, application Canada, Mar. 22, 1979, 323993
Int. Cl.³ B65B *3/04;* B08B *3/02*
U.S. Cl. 141—90 **16 Claims**



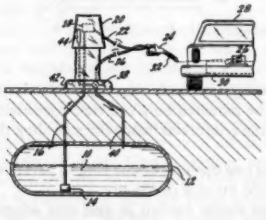
1. In a bottle filling machine in which bottles travel a path from an infeed mechanism to an outfeed mechanism during filling under pressure by a plurality of bottle filling tube mechanisms and in which a bottle may explode due to said pressure, causing glass particles to adhere to its associated filler mechanism, apparatus for cleansing said filler tube mechanisms a plurality of times comprising a broken bottle sensor located between said infeed mechanism and said outfeed mechanism which, in the event of a broken bottle, provides a pulse to activate, for a predetermined period of time, a water spray assembly comprising a plurality of high pressure spray nozzles spaced apart along a portion of said path between said sensor and said outfeed mechanism, said pulse also feeding logic means to record a data bit to indicate each filling tube mechanism associated with a broken bottle, to track the location of said filling tube mechanisms as they move along said path, and to re-activate said spray for said predetermined period of time when each said filling tube mechanism again reaches said sensor.

4,295,504

GASOLINE VAPOR RECOVERY SYSTEM

Detlev E. M. Hasselmann, 519 S. Nardo Ave., Solana Beach, Calif. 92075

Filed Dec. 26, 1979, Ser. No. 106,676
Int. Cl.³ B65B *3/04;* B67C *5/377*
U.S. Cl. 141—290 **5 Claims**



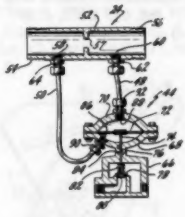
1. Gasoline Vapor Recovery System comprising:
a gasoline storage tank;
a pump coupled to said storage tank;
a gasoline dispenser;
a first hose coupled at one end to said dispensers;
means said coupling said first hose through said dispenser to said pump;
a nozzle on the other end of said first hose;
a vapor sealing means on said nozzle for forming a vapor seal around an opening in a receptacle into which gasoline is being pumped through said nozzle;
a vapor recovery conduit extending from said nozzle to of said storage tank, said conduit having a rigid portion which is conected to said storage tank and a hose portion which is connected to said nozzle;
a valve in said vapor recovery conduit, said valve being positioned in said dispenser between the end of said first hose coupled to said dispenser and said pump;
means for opening said valve in response to predetermined conditions to allow gasoline vapors to flow from said receptacle;
said vapor sealing means comprises a resilient boot on said nozzle and spring means for resiliently urging the boot away from said nozzle, said spring having a force/deflection ratio in the range of 2 to 7 pounds per inch of deflection.

4,295,505

GASOLINE VAPOR RECOVERY SYSTEM

Detlev E. M. Hasselmann, 519 S. Nardo Ave., Solana Beach, Calif. 92075, and Paul D. Labonte, 9371 Fermi Ave., San Diego, Calif. 92123

Filed Dec. 26, 1979, Ser. No. 106,668
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—301 **5 Claims**



1. A gasoline vapor recovery system comprising:
a gasoline storage tank;
a gasoline pump coupled to said storage tank;
a gasoline dispenser;
a vapor recovery nozzle;
a gasoline delivery conduit extending from said gasoline pump, through said gasoline dispenser, and terminating in said vapor recovery nozzle;
means on the end of said vapor recover nozzle for covering the opening in a receptacle in which gasoline is to be pumped;
a vapor recovery conduit extending from said vapor recovery nozzle to said gasoline storage tank;
a pressure responsive valve in said vapor recovery conduit, said valve being positioned below said dispenser;
a flow sensor coupled to said gasoline delivery conduit above the lowest level of said dispenser; and
conduits coupling said flow sensor to said pressure responsive valve to open said pressure responsive valve when gasoline flows through said flow sensor.

4,295,506

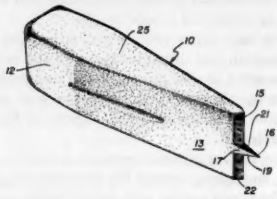
WEDGE

William H. Nicholson, Sutton, Mass., assignor to Norman S. Blodgett, Worcester, Mass.

Continuation of Ser. No. 947,258, Sep. 29, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 97,450

Int. Cl.[3] B27L 7/00

U.S. Cl. 144—193 D 10 Claims



1. Wedge for splitting a wooden log, comprising:

(a) a main body having two plane face surfaces lying at an acute angle to one another, and terminating at a lower end of the wedge,

(b) two plane blade surfaces extending from the lower ends of said face surfaces said blade surfaces lying at an acute secondary angle to one another and terminating in a transverse edge, said secondary angle being substantially greater than the angle between said face surfaces, and

(c) an integral point bounded by two plane surfaces which are continuous with and lie in the respective planes of said face surfaces and extend beyond said transverse edge to assist in introducing the edge into the grain of the log.

4,295,507

LIMBING AND BARKING DEVICE

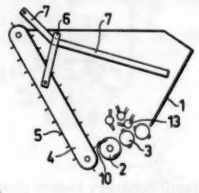
Einar Karlsson, 1208 Abyn, Burträsk, Sweden (S-937 00)

Filed Dec. 14, 1979, Ser. No. 103,943

Claims priority, application Sweden, Dec. 21, 1978, 7813195

Int. Cl.[3] B27L 1/00

U.S. Cl. 144—208 B 4 Claims



1. Apparatus for delimbing and barking trees or tree parts comprising a downwardly tapering trough for receiving the trees or tree parts, said trough having a generally horizontal axis and having one side formed by upwardly and outwardly inclined endless conveyor means which includes drivers projecting therefrom for circulating the trees or tree parts in the trough and for transporting wood upwardly; at least one elongated delimbing roll arranged parallel to the axis of the trough at the bottom thereof, said roll being adjacent the lower end of said conveyor means and rotatable in a direction such that its upper surface rotates toward said conveyor means; and at least one elongated barking roll arranged in side-by-side parallel relationship to said delimbing roll on the side thereof opposite said conveyor means and rotatable in a direction such that its upper surface rotates toward said delimbing roll, said barking roll having longitudinally extending planar peripheral ribs for orienting the stems of the trees or tree parts into parallelism with the barking and delimbing rolls.

4,295,508

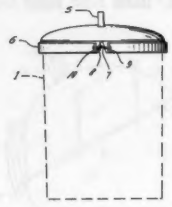
FLEXIBLE GARBAGE CAN LID

Harold L. Metzger, 1402 Fredericksburg Rd., San Antonio, Tex. 78201

Filed Apr. 18, 1980, Ser. No. 141,288

Int. Cl.[3] B65D 65/02; B65B 11/00

U.S. Cl. 150—52 R 1 Claim



1. In a garbage can lid formed of flexible material, a peripheral flange on said lid, a strap integral with said flange and having means for releasably anchoring the lid on the can, said strap being of flexible material and said means for maintaining said strap in holding position on the lid when the lid is mounted on the can consists of integral rigid terminals on the respective ends of said strap, and a hook pivotally mounted on one terminal and an eye for receiving the free end of said hook mounted on the other terminal.

4,295,509

EMERGENCY TRACK RING FOR PNEUMATIC VEHICLE TIRES

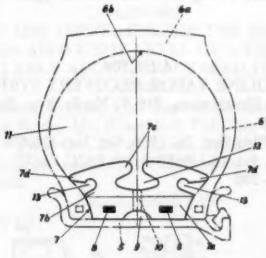
Hermann Stein, Wuppertal-Barmen, Fed. Rep. of Germany, assignor to Vorwerk & Sohn GmbH & Co. KG., Wuppertal-Barmen, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,414

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851187

Int. Cl.[3] B60C 17/04

U.S. Cl. 152—158 10 Claims



1. An emergency track ring for a tubeless pneumatic tire adapted to be mounted on a tire rim, comprising

(a) a bottom reinforced flange for mounting the ring on such rim,

(b) at least one opening in said ring to permit air to be admitted to the interior of the tire,

(c) groove means formed in said ring adapted to be filled with a lubricating material,

(d) sealing lips closing said groove means and sealing said lubricant therein when said tire is mounted on said rim and under pressure,

flange means integrally formed with said sealing lips and extending radially upwardly with respect to said sealing

lips for engagement by the inside of the tire cover during loss of air,

said sealing lips and flange means being formed and arranged such that when said flange means are depressed, lever action causes said sealing lips to move so as to open said grooves and permit said lubricating material to be released to reduce friction between said tire cover and said track ring.

4,295,510

PROTECTIVE TIRE CHAIN ASSEMBLY

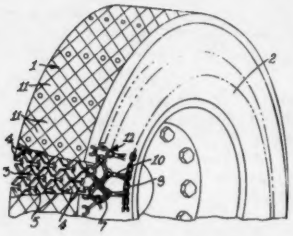
Garth Foxcroft, Wynberg, South Africa, assignor to Dirk Marinus Brink, White River, South Africa

Filed Jun. 29, 1979, Ser. No. 53,224

Claims priority, application South Africa, Jul. 7, 1978, 78/3906

Int. Cl.³ B60C *27/22, 27/20*

U.S. Cl. 152—220 **10 Claims**



1. A tire chain assembly comprising a tire chain having an endless central belt region composed of wear accepting links with connecting links interconnecting said wear accepting links, and having sidewall protecting extensions along the edges of the central belt region and wherein the spaces between the links of the chain are, at least partly, occupied by a wear resistant elastomeric material such that the combination of the material and tire chain form said central belt region having the wear accepting links extending through substantially the entire thickness of such belt region, the tire chain being adapted to be removably located over a tire of suitable size.

4,295,511

RADIAL TIRES PROVIDED WITH A STIFFENING STRUCTURE IN THE SIDEWALLS

Mario Mezzanotte, Milan, and Gianni Turchetti, Bresso, both of Italy, assignors to Societa Pneumatici Pirelli S.p.A., Milan, Italy

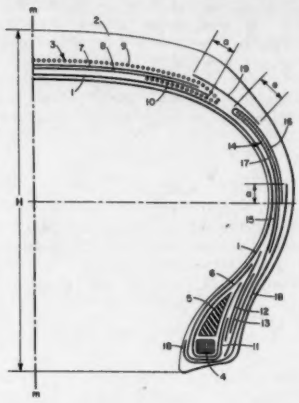
Filed Apr. 1, 1980, Ser. No. 136,352

Claims priority, application Italy, Apr. 10, 1979, 21708 A79

Int. Cl.³ B60C *9/06*

U.S. Cl. 152—354 R **10 Claims**

1. A pneumatic tire for vehicle wheels comprising a radial carcass provided with beads for assembly with a corresponding rim, a tread, and an annular reinforcing structure inserted between the carcass and tread, said annular reinforcing structure being substantially inextensible and having a width which is at least as wide as the tread, said carcass comprising at least one ply of textile or metallic cords lying in substantially radial planes and extending from one bead to another, and turned-up from the inside towards the outside of the tire, around a bead-core contained in each bead, said tire being characterized in that it comprises in each sidewall, a mixed textile-metallic reinforcement member comprising a strip of textile cords doubled over to provide two skirts having different widths, the cords of said skirts being inclined with respect to the radial direction of the carcass cord, and by a strip of metallic cords inclined with respect to said radial direction and narrower then the longer skirt inserted between said skirts to the folded-edge of said strips, said larger skirt being disposed axially outside of said carcass ply and its turned over portion and radially extended from the bead zone to the tire's shoulder, the smaller skirt extending radially towards the inside from said shoulder



to a point disposed in the sidewall, to a height between 66% and 20% of the tire's section height, said metallic cord strip extending from the folded edge of said textile strip to a point situated at a height between 50% and 20% of the section height of the tire.

4,295,512

THICK-CORD LIGHTWEIGHT TIRE BODY HAVING AN IMPROVED FATIGUE LIFE

Yasuyosi Kawaguchi, Higashiyamato; Munetoshi Shimotake, Kodaira, and Fujio Yamamoto, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sep. 4, 1980, Ser. No. 183,900

Claims priority, application Japan, Sep. 4, 1979, 54-112366

Int. Cl.³ B60C *9/06, 15/06*

U.S. Cl. 152—354 R **3 Claims**

1. A thick-cord lightweight tire body having an improved fatigue life, comprising a bias-structured carcass composed of rubberized plies each including thick organic fiber cords having a cord diameter equal to or larger than Nylon 1,890 d/2 and rubber interposed between said carcass plies and having a thickness corresponding to $hm/ho \leqq 0.5$ where hm is an average rubber gauge between said plies at a center position in the widthwise direction of the tire and ho is a diameter of said thick cord, said rubber being a rubber composition consisting essentially of 100 parts by weight of a rubber component and 50–70 parts by weight of carbon black, said rubber component being a mixture of 60–95 parts by weight of at least one rubber selected from the group consisting of natural rubber, synthetic polyisoprene rubber, polybutadiene rubber and styrene-butadi-

ene copolymer rubber and 5–40 parts by weight of at least one liquid polymer selected from the group consisting of liquid polybutadiene, liquid polyisoprene and liquid styrene-butadiene copolymer and having a viscosity-average molecular weight of 3×10^4–10×10^4, said rubber composition having a dynamic modulus of elasticity at 100° C. under 2% elongation of not less than 6.0×10^7 dyne/cm^2, a dynamic loss angle tan δ of not more than 0.095 and a tensile strength of not less than 100 kg/cm^2 as properties after vulcanization and, an apex rubber for stiffening a turnup portion of said carcass wherein a ratio in the dynamic modulus of elasticity of said apex rubber to said rubber interposed between the plies is within a range of 0.9–1.3.

4,295,513

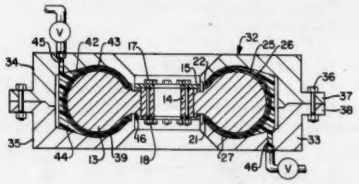
TIRE AND METHOD OF REINFORCEMENT

John A. Lovell, Munroe Falls, and Kenneth W. McIntosh, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 11, 1980, Ser. No. 139,411

Int. Cl.^{3} B60C *9/02*

U.S. Cl. 152—358 **17 Claims**



1. A tire comprising an annular body of elastomeric material having a U-shaped cross section, an annular reinforcing sheet of tubular knit material stretchable into a toroidal configuration for placement in a mold and said reinforcing sheet being under tension in a molded and cured tire.

4,295,514

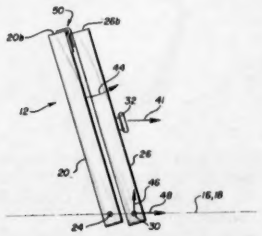
BIFOLD DOOR HINGE ASSEMBLY

Larry K. Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Continuation of Ser. No. 910,106, May 30, 1978, abandoned. This application Nov. 14, 1979, Ser. No. 94,289

Int. Cl.^{3} E06B *3/00*; E05D *7/10*

U.S. Cl. 160—206 **4 Claims**



1. In combination, a bifold door assembly comprising: a pivoted door and a guide door, mounted such that they will be in substantially co-planar relation in the closed condition and at least one hinge assembly interconnecting said doors along a vertical edge thereof, aperture means formed in the upper and lower horizontal edge surfaces of said pivoted door at a predetermined distance from the vertical edge of said door to be disposed adjacent a door frame, said aperture means adapted to receive pivot means for the pivotal mounting of said door, and aperture means formed in the upper and lower horizontal edge surfaces of said guide door at a predetermined distance from the vertical edge thereof remote from said pivoted door for the receipt of guide means to be disposed in horizontal linear track means to confine said edge for linear movement upon opening and closing of said assembly, the respective predetermined distances providing for the spacing of said aperture means from the said door edges being substantially equal, and said at least one hinge assembly including first and second interconnected leaf members each leaf member including a planar portion affixed to corresponding side surfaces of the pivoted and guide doors and each leaf member further including knuckle means, which knuckle means are disposed coaxially, said leaf members being mounted with said knuckle means offset from the interface of the respective door edges in a direction toward said pivot door, such that when said doors are in the mounted, fully open condition, said guide door will be disposed at an obtuse angle with respect to the associated track means, which facilitates closing movement, said obtuse disposition being attained with the use of door panels with identically positioned aperture means.

4,295,515

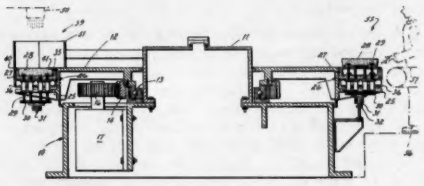
AUTOMATIC CONE AND MOLD-MAKING MACHINE

William L. Tordoff, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 20, 1980, Ser. No. 131,915

Int. Cl.^{3} B22C *11/04, 13/14, 17/12*

U.S. Cl. 164—158 **7 Claims**



1. A no-bake molding machine comprising,

a base,

a generally circular frame mounted for rotation on said base,

a plurality of concave patterns mounted around the circumference of said frame,

plate means surrounding said patterns and extending around the perimeter of said frame to form with said patterns a substantially flush, flat, continuous surface around the top of said frame surrounding said concave patterns,

means for continuously rotating said frame,

a mixer for filler located adjacent said frame and having a discharge spout overlying said patterns and continuous surface, said mixer and filler mixing sand with a no-bake binder and depositing sand and binder on said patterns and continuous surface,

and a stationary plow adjacent the mixer and filler engaging said plate means for scraping excess sand off said surface and leveling the sand in each pattern as it passes under said plow.

4,295,516

SYMMETRICAL HORIZONTAL CONTINUOUS CASTING

Robert Wilson, Dundee, Scotland, assignor to Timex Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 958,774, Nov. 8, 1978, Pat. No. 4,216,818. This application Dec. 7, 1979, Ser. No. 101,389

Int. Cl.^{3} B22D *11/124, 11/00*

U.S. Cl. 164—464 **16 Claims**

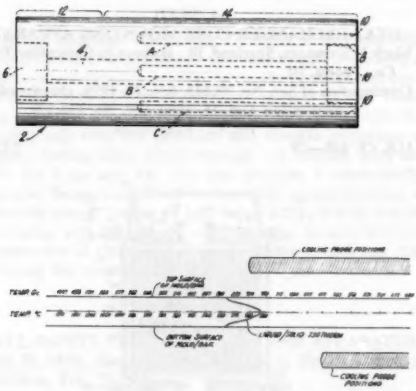
1. In a horizontal continuous casting process wherein molten

metal is continuously passed through a mold body having a substantially horizontal solidification chamber extending interiorly along the length thereof with an inlet end for receiving molten metal from a source and an outlet end through which solidified metal exits, the steps of:

(a) providing a plurality of cooling bores in the mold body spaced around the periphery of the solidification chamber from the bottom to the top thereof, each cooling bore having an open end on the outlet end of the mold body and extending toward the inlet end to define a peripheral cooling section adjacent said outlet end; and

(b) inserting an elongated cooling probe into the open end of each cooling bore to provide cooling to said peripheral cooling section with the cooling probe insertion distance into the bores increasing from the bottom to the top of the mold body such that a liquid/solid solidification front which intersects the top and bottom of said chamber at approximately the same location along its length is established in the molten metal, whereby hot tears, fissures and other surface defects resulting from asymmetric solidification of the bottom portion of molten metal ahead of the top portion are reduced.

8. A mold assembly for horizontally continuously casting molten metal comprising:



(a) a mold body having a substantially horizontal solidification chamber therethrough with an inlet end for receiving molten metal from a molten metal source and an outlet end through which solidified metal exits and having a plurality of longitudinal cooling bores spaced around the solidification chamber from the bottom to the top thereof, the cooling bores each having an open end on the outlet end of the mold body and extending only partially therethrough toward the inlet end to define an insulating section adjacent said inlet end to minimize heat removal from said molten metal source and a peripheral cooling section adjacent said outlet end, and

(b) a plurality of elongated cooling probes each of which is inserted into the open end of a cooling bore to provide cooling to said peripheral cooling section with the cooling probe insertion distance into the bores increasing from the bottom to the top of the mold so that a liquid/solid solidification front which intersects the top and bottom of said chamber at approximately the same location along its length is established in the molten metal, whereby hot tears, fissures and other surface defects resulting from asymmetric solidification of the bottom portion of molten metal ahead of the top portion are reduced.

4,295,517

REUSABLE HEAT DEVICES CONTAINING XYLITOL AS THE HEAT-STORAGE MATERIAL

Woldemar Guex, 4 Spechtweg, Bottmingen; Heinrich Klaeui, 77 Kilchgrundstrasse, Riehen; Horst Pauling, 39 Ruchholzstrasse, Bottmingen, and Felix Voirol, 26 Poolstrasse, Füllinsdorf, all of Switzerland

Division of Ser. No. 916,424, Jun. 16, 1978, abandoned. This application May 20, 1980, Ser. No. 152,056

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—1 **6 Claims**

1. A method for providing a source of heat which comprises

(a) adding, as a heat storage material, xylitol to a container;

(b) heating the xylitol in the container to a temperature above its melting point;

(c) cooling the resulting melt to a temperature below the melting point of xylitol without crystallizing the xylitol and

(d) initiating crystallization of the xylitol

whereby the release of the heat of crystallization of xylitol provides a source of heat.

4,295,518

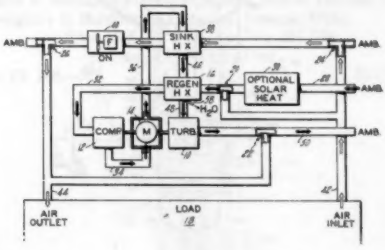
COMBINED AIR CYCLE HEAT PUMP AND REFRIGERATION SYSTEM

George C. Rannenberg, Canton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 1, 1979, Ser. No. 44,840

Int. Cl.³ F25B *13/00*

U.S. Cl. 165—2 **11 Claims**



1. A combined air cycle heat pump and refrigeration system for a load comprising:

a source of low pressure refrigerant air at essentially ambient pressure, said refrigerant air being ambient air when said system is operating in the heat pump mode and being air returned from said load when said system is operating in the refrigeration mode;

a turbine driven compressor receiving said refrigerant air and increasing the temperature and pressure thereof;

means for conducting said compressed refrigerant air to said turbine for expansion therein and discharge therefrom whereby said refrigerant air is reduced in temperature;

means for conducting the refrigerant air discharged from said turbine directly to the ambient when said system is operating in the heat pump mode, and for conducting the refrigerant air discharged from said turbine directly to said load when said system is operating in the refrigeration mode;

a regenerative heat exchanger connecting through heat transfer surfaces within said regenerative heat exchanger the source of low pressure refrigerant air with the compressed refrigerant air upstream of said turbine whereby said compressed refrigerant air rejects some of its heat to said low pressure refrigerant air from said source and reduces the temperature of the compressed refrigerant air fed to said turbine so as to maximize the reduction in the temperature of the refrigerant air discharged from said turbine;

additional heat exchange means downstream of said com-

pressor and upstream of said regenerative heat exchanger on the high pressure side thereof, said compressed refrigerant air passing through said additional heat exchange means;

an additional fluid, said fluid being fluid returned from said load when said system is operating in the heat pump mode and said fluid being ambient air when said system is operating in the refrigeration mode;

means for passing said fluid through said additional heat exchange means in heat exchange relation with said compressed refrigerant air whereby said fluid absorbs heat from said compressed refrigerant air;

and means for returning said fluid to supply heat to said load when said system is operating in the heat pump mode and returning said fluid to ambient when said system is operating in the refrigeration mode.

4,295,519

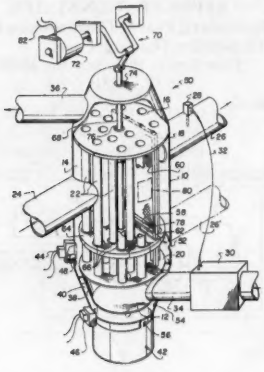
HEAT RECLAIMER

Leslie Bellaff, 416 Windsor Rd., River Edge, N.J. 07661

Filed Nov. 13, 1979, Ser. No. 93,873

Int. Cl.³ F28F *19/00*

U.S. Cl. 165—11 R **18 Claims**



1. A heat reclaimer for the exhaust flue of a heating unit comprising; a housing having an air input space, an air output space and an exhaust space; tube means connected between and communicating said air input and output spaces, extending through said exhaust space; the exhaust flue of the heating unit connected to said housing and into said exhaust space; an exhaust output connected to said housing and into said exhaust space for venting exhaust coming from the heating unit through the exhaust flue, out of said exhaust space; and a level switch connected to said housing at a location spaced from the top of said exhaust space activated if water accumulates in said exhaust space from condensed water vapor in the exhaust; said housing having at least one hole therethrough communicating with said exhaust space in the vicinity of the level of said level switch for draining water in said exhaust space rising to the level of said hole.

4,295,520

HEAT TRANSFER SYSTEM

Helmut Wulf, Ostfildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

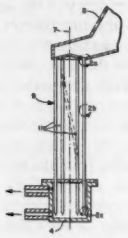
Filed Jul. 10, 1979, Ser. No. 56,234

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2834838

Int. Cl.³ F28D *15/00*; **B60H** *1/04*

U.S. Cl. 165—41 **24 Claims**

23. A heat pipe arrangement comprising a bundle of elastically deformable small tubes extending essentially parallel to one another and being operatively connected to each other so as to permit relative movement therebetween, at least one adjoining heat pipe means for accommodating one end of each of the tubes, each of said tubes is constructed as a heat pipe which is sealed toward the outside and open toward an interior



of at least one adjoining heat pipe means so as to enable vapor produced in a heat-emitting zone to flow inside of the respective tubes into a heat-consuming zone and condensate produced in the heat-consuming zone to return inside of the respective tubes to the heat-emitting zone.

4,295,521

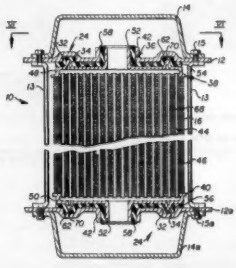
HEAT EXCHANGER CORE MOUNTING APPARATUS

Mark F. Sommars, Sparland, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 99,143, Sep. 27, 1979, abandoned. This application Aug. 15, 1980, Ser. No. 178,278

Int. Cl.³ F28F *9/26*

U.S. Cl. 165—69 **7 Claims**



1. A heat exchanger comprising:

first and second frame members (**12**,**12***a*) each having a bore (**42**) therein;

a core (**16**) extending between the frame members (**12**,**12***a*) and having first and second opposed end portions (**38**,**40**), each end portion having a spout (**52**) extending outwardly into the bore (**42**) of the adjacent frame member (**12**,**12***a*);

resilient means (**36**) for resiliently and sealingly supporting the core (**16**) between the frame members (**12**,**12***a*), said resilient means including a pair of resilient pads (**54**,**56**) each positioned between one of the end portions (**38**,**40**) and the adjacent frame member (**12**,**12***a*); and

means (**24**) for locating the core (**16**) in a predetermined registration with the frame members (**12**,**12***a*), said means (**24**) including an imperforate protuberance (**34**) extending outwardly from one of said first end portions (**38**) and said first frame member (**12**) and spaced from the spout (**52**), and an imperforate recess (**32**) in the other of said first end portion (**38**) and said first frame member (**12**) and being in registry with the protuberance (**34**), said one resilient pad (**54**) positioned between said first end portion (**38**) and said

first frame member (12) having a portion (62) resiliently accommodating the protuberance (34) and the recess (32).

4,295,522

PROCESS FOR THE PRODUCTION OF A TUBULAR HEAT EXCHANGER, AND A TUBULAR HEAT EXCHANGER PRODUCED ACCORDING TO THIS PROCESS

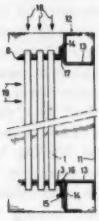
Willi Frei, Zilstrasse 16, CH-9016, St. Gallen, Switzerland

Filed Aug. 2, 1978, Ser. No. 930,363

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734958

Int. Cl.³ F28F *9/16*

U.S. Cl. 165—79 **3 Claims**



1. A heat exchanger comprising a housing, at least one tube bundle disposed in said housing, each tube bundle containing a plurality of substantially parallel tubes, the opposite end portions and a substantially intermediate portion of said tubes being disposed in troughs containing a plurality of holes for receiving said tube end portions, said troughs containing a solidified casting resin which extends into annular gaps between the holes and the tube end portions, a substantially horizontal flange being fixed to the inside of said housing, a lowermost trough resting on said flange and said tube bundle cooperating with the housing so that a gap is formed between the sidewalls of the troughs and the housing, said gap also containing the casting resin.

4,295,523

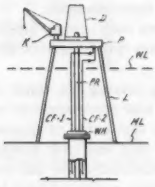
WELL SAFETY SYSTEM METHOD AND APPARATUS

James D. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Division of Ser. No. 2,197, Jan. 9, 1979. This application Dec. 12, 1979, Ser. No. 102,913

Int. Cl.³ E21B *43/10*

U.S. Cl. 166—250 **1 Claim**



1. A method of operably installing in a single trip a well safety system having a full opening remote controlled subsurface safety valve in the well, including the steps of:

connecting a subsurface tubing hanger in a string of well tubing;

connecting the full opening remote controlled subsurface safety valve in the well tubing above the subsurface tubing hanger;

connecting a full-strength safety joint in the well tubing above the full opening remote controlled subsurface safety valve;

connecting a predetermined amount of well tubing above the subsurface safety valve while moving the subsurface safety valve in the well;

mounting a wellhead hanger above the predetermined amount of well tubing;

positioning the wellhead hanger a predetermined distance above the wellhead;

determining the weight supported by the wellhead hanger when positioned the predetermined distance above the wellhead;

setting the subsurface tubing hanger in the well for supporting the string of well tubing below the subsurface tubing hanger;

lowering the wellhead hanger into the wellhead;

determining the weight supported by the wellhead hanger while lowering the wellhead hanger into the wellhead;

comparing the weight supported determinations to develop a sufficient difference to indicate the subsurface tubing hanger is supporting the portion of the well tubing suspended therefrom;

activating the safety joint to reduce the strength of the safety joint; and

operating the subsurface safety valve to enable flow through the well tubing.

4,295,524

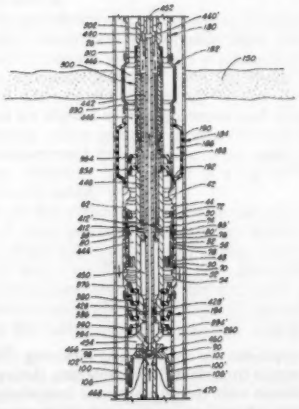
ISOLATION GRAVEL PACKER

Eugene E. Baker, and David D. Szarka, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 27, 1979, Ser. No. 107,739

Int. Cl.³ E21B *43/04*

U.S. Cl. 166—278 **57 Claims**



1. A well treatment apparatus of a type to be disposed within a conduit in a well bore, in fluid communication with first and second tubing means, said apparatus comprising:

treatment means containing first and second passage means, check valve means, and third passage means;

said first passage means in fluid communication with said first tubing means above said treatment means and with the bore of said conduit below said treatment means;

said second passage means in fluid communication with said second tubing means above said treatment means and with the annulus between said treatment means and said conduit;

said check valve means being disposed in said first passage means; and

said third passage means being longitudinally fixed and in

fluid communication with said annular and with said first passage means above said check valve means.

38. A method of gravel packing a producing zone in a well bore, comprising:

(a) placing a conduit having a gravel screen therein in said well bore, said gravel screen being positioned across said zone;

(b) pumping a gravel slurry down first tubing means to a location above said zone;

(c) routing said gravel slurry outside said conduit and down to the level of said gravel screen;

(d) arresting the flow of said gravel with said screen while allowing the slurry carrier fluid to pass therethrough;

(e) returning said carrier fluid to the surface via second tubing means;

(f) continuing steps (d) and (e) until a gravel pack is effected;

(g) pumping fluid down said second tubing means to the vicinity of said zone and returning said fluid to the surface via said first tubing means without inducing fluid movement within the conduit bore area defined by the top and bottom of said gravel screen.

4,295,525

METHOD AND APPARATUS FOR QUICK REPLACEMENT OF CARTRIDGE FILTERS USED IN WELL FLUID CLEANING OPERATIONS

Edward R. Swift, Jr., Houston, and Philip W. Schmuck, Spring, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Feb. 6, 1980, Ser. No. 118,958

Int. Cl.[3] **B01D** *27/00, 27/08, 29/10;* **E21B** *43/00*

U.S. Cl. 166—312 **4 Claims**

1. In an apparatus for treating and removing contaminate particulate matter from fluid circulatable into, through and out of a subterranean well, the improvement comprising: a cylindrical housing adapted to receive and discharge said fluid; means disposed across said cylindrical housing for separating said cylindrical housing into a first fluid chamber for receiving fluid to be filtered and a second fluid chamber for receiving filtered fluid; at least one cartridge filter adapter receiving means disposed through said separating means; a cartridge filter adapter secured within each of said receiving means, said adapter having an elongated cylindrical housing, and having a fluid flow passageway therethrough communicable to each of said first and second fluid chambers, said elongated cylindrical housing having an enlarged cartridge positioning portion extending radially away from and about the axis of said elongated cylindrical housing, said cartridge positioning portion having first and second faces thereon; groove means on said adapter circumferentially extending around the exterior of said elongated cylindrical housing for sealingly securing one end of said cartridge filter thereon; cartridge filter means positionable on said adapter and extending within said first fluid chamber; and seal means disposed at one end of said cartridge filter and having an interiorly facing circumferentially extending flexible lip for contact with the exterior of said elongated cylindrical housing upon location of said cartridge filter on said adapter, said lip being sealingly securable within said groove.

4. A method for treating and removing contaminate particulate matter from fluid circulatable into, through and out of a subterranean well, comprising the steps of: (1) establishing a fluid flow path into, through and out of said well; (2) circulating fluid in said flow path; (3) introducing said circulated fluid into at least one filtering vessel, said vessel comprising: a cylindrical housing adapted to receive and discharge said fluid; means disposed across said vessel for separating said vessel into a first fluid chamber for receiving fluid to be filtered from said well and a second fluid chamber for receiving filtered fluid for subsequent circulation into said well; at least one cartridge filter adapter receiving means disposed through said separating means; a cartridge filter adapter secured within each of said receiving means, said adapter having an elongated cylindrical housing and having a fluid flow passageway therethrough communicable to each of said first and second fluid chambers, said elongated cylindrical housing having an enlarged cartridge positioning portion extending radially away from and about the axis of said elongated cylindrical housing, said cartridge positioning portion having first and second faces thereon; groove means on said adapter circumferentially extending around the exterior of said elongated cylindrical housing for sealingly securing one end of said cartridge filter thereon; cartridge filter means positionable on said adapter and extending within said first fluid chamber; and seal means disposed at one end of said cartridge filter and having an interiorly facing circumferentially extending flexible lip for contact with the exterior of said elongated cylindrical housing upon location of said cartridge filter on said adapter, said lip being sealingly securable within said groove; and (4) circulating into said well fluid discharged from said second chamber of said vessel.

4,295,526

METHOD AND APPARATUS FOR CONNECTING STEEL PIPE SECTIONS

Ernest D. Hauk, Yucca Valley, and Larry Stewart, Joshua Tree, both of Calif., assignors to Service Equipment Design Co., Inc., Signal Hill, Calif.

Filed Feb. 21, 1979, Ser. No. 13,671

Int. Cl.[3] **E21B** *43/10;* **B23P** *19/04;* **B23Q** *3/00;* **F16L** *21/04*

U.S. Cl. 166—315 **15 Claims**

1. A method of forming a casing string in a well, comprising:

(a) providing a plurality of sections of casing pipe having a predetermined outer diameter,

(b) introducing one such section into the well hole,

(c) providing a joint ring formed of strong and elastic material,

said joint ring having an inner diameter sufficiently smaller than said predetermined outer diameter of said pipe sections that entry of opposed ends of said pipe sections into said ring will expand said ring and thus cause it to frictionally grip said ends very tightly,

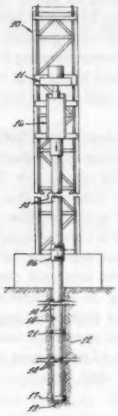
(d) providing a clasp means adapted to hold said joint ring and also adapted to receive and align the ends of said pipe sections whereby said ends may enter properly the opposite sides of said ring,

(e) placing said joint ring in said clasp means, and introducing the ends of said one casing section and a second casing section into said clasp means to thus cause said ends to be in coaxial relationship with said clasp means and coaxially aligned with each other,

(f) applying large axial forces to said coaxially-aligned pipe sections to cause said ends thereof to be forced into said

ring and to be frictionally gripped therein while said ring is thus held in said clasp means,

(g) removing said clasp means, and



(h) repeating said steps (b) through (g) with additional ones of said joint rings and casing sections until the casing string has attained the desired length.

4,295,527

PROCESS AND DEVICE FOR THE CENTERING OF CASINGS AS USED FOR UNDERGROUND DRILLING

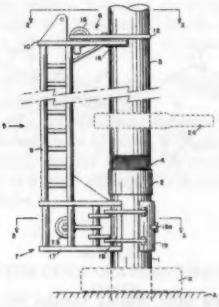
Rolf A. Rüsse, Celle, Fed. Rep. of Germany

Filed Apr. 9, 1979, Ser. No. 28,007

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 2815705

Int. Cl.[3] **B25B** *1/20;* **E21B** *19/16*

U.S. Cl. 166—315 **12 Claims**



1. A method for centering casings for deep well drillings, particularly in the off-shore region, which comprises the steps of:

lowering the uppermost casing section of a casing string into the bore hole of a well until only the upper threaded end thereof is above a work platform;

securing the casing in the bore hole against rotational and longitudinal movement;

raising a next section of casing having a threaded section on each end to a vertical position and positioned over the upper end of the casing in the bore hole;

lowering the lower threaded end of the raised casing section into the upper threaded end of the uppermost casing in the bore hole by means of a crane and the like;

attaching a clamping means to the upper portion of the uppermost casing section in the bore hole, said clamping means having an upwardly-extending portion extending substantially parallel to the casing for a distance equal to a substantial portion of the length of a casing;

providing a second clamping means operably independent of said first clamping means fixedly supported on the upper extremity of the upwardly-extending portion, which clamping means is adapted to clamp and hold the raised section of casing in coaxial alignment with the casing in the bore hole;

rotatably securing the raised section of casing to the second clamping means, supported on the vertical extending portion, to engage, position and maintain the raised casing, at a point removed from said first clamp a substantial portion of the length of a casing, in coaxial alignment with the casing in the bore hole; and,

screwing the threads on the lower end of the raised casing section to the mating threads in the threaded end of the uppermost casing section to firmly secure the raised casing to the downhole casing by rotating the raised pipe casing.

2. Apparatus for centering and axial alignment of a superposed section of casing with an underlying casing section while being supported in a vertical position to permit the superposed section to be threadedly secured to the underlying casing section comprising:

first independently operated clamping means adapted to be securely clamped to the upper part of the underlying casing section;

extension means rigidly connected to said clamping means to extend upwardly alongside the casing for a substantial portion of the length of a superposed casing section;

said extension means being connected to said clamping means so as to extend in substantially parallel relation when the clamping means is fastened to the underlying casing section;

second independently operated clamping means mounted on the upper extremity of the extension means positioned and adapted to receive and support a superposed section of casing in coaxial alignment with the underlying casing section whereby the threads of the superposed casing section are aligned in mating relation with threads on the underlying casing section to permit threaded attachment of the superposed casing section to the underlying casing section essentially independent of a rig by turning the superposed casing;

wherein the first clamping means comprises a carrier plate, a pair of crank arms pivotally attached thereto, a pair of clamp elements having jaws operatively connected to one end of each crank arm and a piston and cylinder means operatively connected to the other ends of the crank arms adapted on actuation of the piston and cylinder means to clamp the clamp elements about said underlying casing section.

4,295,528

SELECTIVE LOCK WITH SETTING AND RETRIEVING TOOLS

Michael Carmody, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

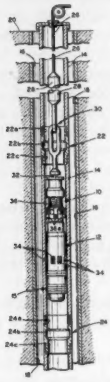
Filed Jun. 16, 1980, Ser. No. 159,531

Int. Cl.[3] **E21B** *23/02*

U.S. Cl. 166—315 **20 Claims**

1. A lock for securing a well tool in a selected one a plurality of landing nipples in a well conduit, each said nipple defining an internal shoulder of diameter less than the conduit bore and an annular locking recess above the shoulder having a diameter greater than the conduit bore, comprising: an annular housing having a plurality of circumferentially spaced windows; a plurality of axially extending locking dogs having enlarged portions respectively aligned with and entering said windows; means in said housing for shiftably mounting said dogs to permit said enlarged portions to move through said windows

to project radially beyond said housing; a camming sleeve axially slidably mounted within said housing and having a series of axially spaced, external cylindrical cam surfaces selectively engagable with the inner surfaces of said dogs, said cam surfaces increasing in diameter downwardly, whereby relative upward movement of said camming sleeve will radially shift the locking dog ends successively from a fully retracted position, to a partially projecting no-go position, and then to a fully projecting locking position, the effective maximum diameter of said locking dog ends in said no-go position being greater than



said internal shoulder diameter but less than the conduit bore diameter; resilient means urging said camming sleeve upwardly, the top portions of said camming sleeve defining a plurality of peripherally spaced, resilient fingers having enlarged end portions; said enlarged finger end portions being arranged for detachable engagement by a running tool to successively shift the vertical position of said camming sleeve relative to said locking dogs from said fully retracted position, to said partially retracted position and then to said fully projecting position upon successive relative upward movements of said running tool.

4,295,529

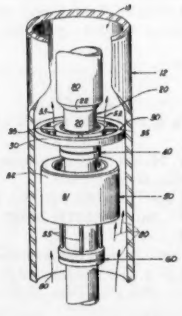
BLOW-OUT PREVENTOR

William N. Strickland, 210 Tudor St., Houma, La. 70360

Filed Nov. 8, 1979, Ser. No. 92,573

Int. Cl.[3] E21B *21/10, 34/08*

U.S. Cl. 166—325 **9 Claims**



1. A blow out preventor assembly for attachment to the drill stem placed within the drill casing during well drilling operations comprising:

a. a bottom seal assembly having attachment means for slideably attaching said bottom seal assembly to a section of drill stem, which has been placed during drilling operations within a section of drill casing, said bottom seal assembly flow opening area allowing fluids to flow thereby and providing an upper valve closure surface;

b. a first lower seat ring having an inner opening corresponding to the sectional configuration of the drill stem and providing an attachment opening for affixing said seat ring to the drill stem, said lower seat ring disallowing downward movement to said bottom seal assembly with respect to the drill stem;

c. port-ring means slideably attachable to the drill stem and having and outer diameter substantially equal to the inside diameter of the drill casing, for forming a flow closure between said drill stem and the drill casing with said port-ring having at least one flow opening allowing fluid to pass thereby and a valve seat at said opening; and

d. a second uppermost seat ring having an inner opening corresponding to the sectional configuration of the drill stem and providing an attachment opening for affixing said seat ring to said drill stem, said port-ring means resting upon said second uppermost seat ring, said second ring preventing downward movement of said port-ring means with respect to the drill stem.

4,295,530

LOWER LINK DRAFT SENSING SYSTEM ON TRACTOR

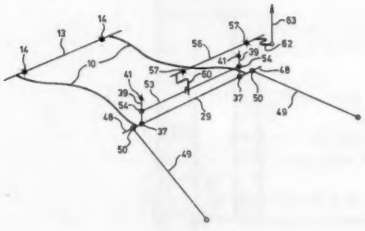
Herbert E. Ashfield; Harry Horsfall, and Philip M. Wade, all of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England

Filed Mar. 24, 1980, Ser. No. 133,190

Claims priority, application United Kingdom, Mar. 30, 1979, 11309/79

Int. Cl.[2] A01B *63/112*

U.S. Cl. 172—7 **6 Claims**

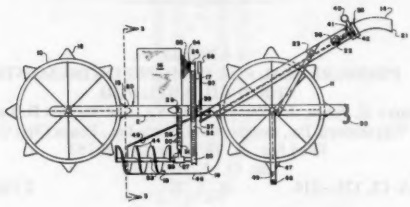


1. A lower link draft sensing system, on an agricultural tractor having a hydraulic power lift mechanism, comprising two bowed rearwardly-extending leaf springs anchored to the tractor frame at their front ends and adapted to elongate in a rearward direction when under tension, two laterally-spaced arms pivotally connected at their upper ends to the tractor frame and universally connected at their lower ends to a cross-bar secured between the rear ends of the respective springs, two lower hitch links universally connected at their front ends to points on the cross-bar which points are laterally offset from said arms, a laterally-extending unstressed summating bar universally connected at its ends to the respective arms and disposed in parallel relationship to the cross-bar, and a draft signal transmitting member actuated by the summating bar at a point between the ends of said bar and adapted to control automatically the power lift mechanism by way of linkage.

4,295,531
AUGER-EQUIPPED PLOW

Hubert E. Strickland, 2205 Ardmore Ave., Chesapeake, Va. 23324

Filed Nov. 5, 1979, Ser. No. 91,652
Int. Cl.³ A01B *33/04*; B62D *51/04*
U.S. Cl. 172—42 3 Claims



1. A mechanically driven ground working implement comprising:

(a) a horizontally disposed rigid elongated framework,

(b) front and rear wheels rotatably mounted on said framework adjacent the opposite extremities thereof, said wheels provided with peripherally mounted projections which interact with the ground to provide traction for said implement,

(c) a pair of control handles attached to said framework and extending upwardly and rearwardly therefrom in symmetrically opposed relationship,

(d) a power source in the form of a fuel-powered engine mounted on said framework between said wheels,

(e) drive means extending downwardly from said power source,

(f) forwardly and substantially horizontally directed auger means pendantly supported by said framework said auger means being comprised of a center core and spiralled blade member having an outer edge, the rearward extremity of said auger means being engaged by said drive means,

(g) means to adjust the elevation of said auger means, and

(h) a truncated hollow V-shaped plowshare supported by said framework in a disposition closely above said auger means, said plowshare having an inside surface and a forward end,

(i) the forward end of said auger protruding in front of the forward end of said plowshare,

(j) the outer edge of said blade member being adjustably located between about 1" and 4" from the inside surface of said plowshare, and the lowermost portion of said outer edge being at a level adjacent the lowermost portion of said plowshare.

4,295,532
PLANTER WITH COOPERATING TRASH CLEARING DISCS

Donald E. Williams; Forrest E. Robertson; C. Dean Gigot, and Terry K. Gigot, all of Garden City, Kans., assignors to Acra-Plant, Inc., Garden City, Kans.

Filed Nov. 2, 1979, Ser. No. 90,790
Int. Cl.³ A01C *5/06*
U.S. Cl. 172—184 9 Claims

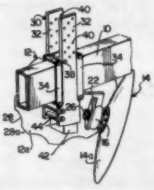
1. In a farm implement having a furrow-opening tool thereon, an attachment for moving debris outwardly in opposite directions ahead of said tool, said attachment including:

a pair of side-by-side convex-concavo discs having sharpened, circular peripheries adapted to penetrate the soil and disposed with their convex faces back to back,

at least one of the discs being peripherally notched;

a support between the discs and common thereto; and

means for each disc respectively rotatably mounting the same on the support with the discs converging relatively toward the normal path of travel of said support and with notched disc leading the other disc,

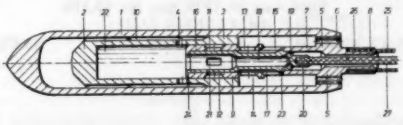


the discs being relatively overlapped at their zones of convergence and overlapping said path of travel at their zones of convergence.

4,295,533
PNEUMATICALLY OPERATED RAM BORER

Paul Schmidt, P.O.B. 20, 5940 Lennestadt/Saalhausen, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 129,835
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979 2911837
Int. Cl.³ E21B *11/02*
U.S. Cl. 175—19 7 Claims



1. In a self-driven pneumatically operated ram borer, said ram borer including a tubular casing, a hose connected to said tubular casing for the supply of compressed air thereto, a percussion piston axially slidably mounted in said casing for reciprocating motion therein, means defining control ports in said piston, a control tube extending into said piston for controlling said reciprocating motion of said piston by opening and closing said control ports, means movably mounting said control tube and control means for moving said control tube between a first position in which said piston is caused to move so that it drives said borer forwards and a second position in which said piston is caused to move so that it drives said borer rearwardly, the improvement wherein said control means comprises elongate flexible actuating means extending through the inside of said hose into said casing, said flexible actuating means being coextensive with and extending within said hose to a location remote from said tubular casing, means connecting said flexible actuating means to said control tube, and said flexible actuating means being rotatable relative to said hose and having a cross-sectional area smaller than the cross-sectional area within said hose so that compressed air can flow through said hose for operating said ram borer.

4,295,534
WELL BORING RIGS AND SPOIL HANDLING CONVEYOR APPARATUS THEREFOR

Thomas R. Zachmeier, Box 131, Mandan, N. Dak. 58554

Filed Mar. 29, 1979, Ser. No. 25,026
Int. Cl.³ E21B *21/06*
U.S. Cl. 175—88 8 Claims

1. In an apparatus for boring holes in the earth, the apparatus including:

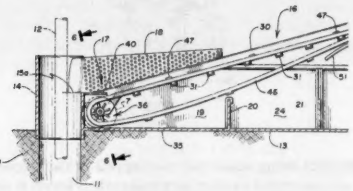
(1) rotary boring means for boring a hole;

(2) means for introducing drilling fluid to the boring area;

(3) fixed wall structure surrounding the boring means for receiving spoil laden drilling fluid from a hole being

bored, the wall structure having an opening for discharging the spoil-laden fluid, and

(4) continuous conveyor means having an inlet end located at the opening in the wall structure for receiving the discharged spoil-laden drilling fluid;



the improvement wherein the conveyor comprises

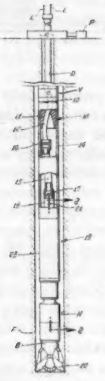
(5) a plurality of V-type conveyor belts defining a conveyor working surface, the belts being arranged in side-by-side yet spaced apart relationship for allowing drilling fluid to drain therebetween while the belts carry the spoil away.

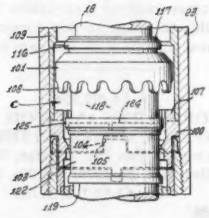
4,295,535

IN-HOLE MOTOR DRILL WITH LOCKING BIT CLUTCH

Gary M. Crase, Cypress, and Kurt M. Trzeciak, Irvine, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 20, 1979, Ser. No. 68,212
Int. Cl.³ E21B *3/12*
U.S. Cl. 175—101 **16 Claims**





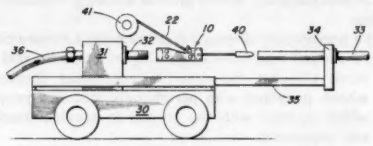
1. An in-hole motor assembly adapted for connection with a rotatable pipe string and a bit, said assembly comprising: a motor stator including a housing structure connectable at one end to a pipe string; a rotor in said stator connected at one end to a shaft for rotation therewith and extending at the other end of said shaft from said housing for connection to a drill bit; thrust bearing between said shaft and said housing structure to transmit thrust from said housing to said shaft; a clutch engageable between said shaft and said housing to couple said housing structure and shaft for mutual rotation and a lock holding said clutch against disengagement on application of thrust between said housing and said shaft.

4,295,536

PRESSURE SEAL FOR PUMPING INSTRUMENTS THROUGH DRILL ROD

Emrys H. Jones, Jr., Westover, W. Va., and Stephen D. Lauer, Waynesburg, Pa., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 28, 1979, Ser. No. 80,352
Int. Cl.³ E21B *47/12*
U.S. Cl. 175—214 **2 Claims**



1. In a system for taking surveys of borehole conditions in a generally horizontal borehole being drilled, said system comprising a drill rod, a survey probe in the drill rod adapted to be pumped through the drill rod and retrieved by reeling in a cable attached to the probe, a pump for pumping fluid through the drill rod to force the survey probe therethrough, a rotary motor between the pump and the drill rod, and a pipe extending from the rotary motor in alignment with the drill string;

the improvement wherein a sealing device positioned between said pipe and said drill rod is provided, said sealing device comprising:

(a) a housing having a central flow passage therethrough and an enlarged recessed opening in each end therethrough, said housing being of split construction and having two half sections;

(b) a first seal in one end of said housing adapted to sealingly engage said drill rod when pressed thereagainst;

(c) a second seal in the other end of said housing adapted to sealingly engage said pipe when pressed thereagainst;

(d) an instrument cable entrance opening extending from outside said housing to said flow passage, said opening being bisected by the connecting plane of said two half sections, said opening being at an acute angle with respect to said flow passage; and

(e) packing means in said opening allowing movement of an instrument cable therethrough and preventing leakage therefrom.

4,295,537

SPONGE MEASURING DEVICE

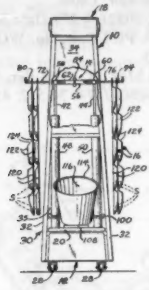
James D. McAvinn, Chicago; Arthur R. Meister, Park Ridge, and Samuel M. Tucker, Barrington, all of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Mar. 21, 1980, Ser. No. 132,585
Int. Cl.³ G01G *19/40, 13/14, 19/52, 21/22*; A47F *7/08*
U.S. Cl. 177—15 **18 Claims**

1. A device for measuring sponges, comprising:

measuring means for indicating the weight of an applied object;

means operatively applied to the measuring means for retaining a plurality of wetted sponges; and



electronic means operatively associated with the measuring means for determining the total weight of liquid in said retained sponges.

4,295,538

AUXILIARY POWER SYSTEM FOR AUTOMOTIVE VEHICLE

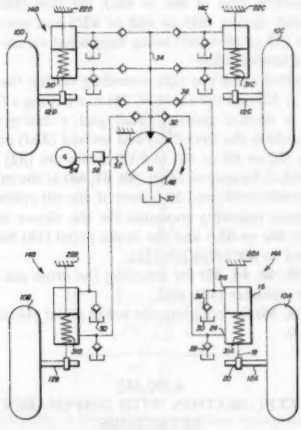
Alexander J. Lewus, 9844 N. 11th Ave., Phoenix, Ariz. 85021

Continuation of Ser. No. 926,373, Jul. 20, 1978, abandoned, which is a continuation of Ser. No. 812,528, Jul. 5, 1977, abandoned, which is a continuation of Ser. No. 633,825, Nov. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 453,293, Mar. 21, 1974, Pat. No. 3,921,746. This application Sep. 17, 1979, Ser. No. 76,081

The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.³ B60K *25/10*

U.S. Cl. 180—165 **5 Claims**



1. A suspension and auxiliary power system for a vehicle having a frame, a power consuming load on said frame, and at least one supporting wheel adapted to move vertically relative to said frame, said system comprising: a fluid pump including a housing adapted to be connected to one of said frame and said wheel and a reciprocal piston adapted to be connected to the other of said frame and said wheel, said housing and piston forming at least one fluid pumping chamber whose volume is expanded and contracted by vertical movement between said frame and said wheel; a uni-directional fluid motor; said motor adapted to drive said power consuming load; and fluid circuit means connecting said chamber to said motor said circuit means including a first check valve for directing fluid only from said chamber directly to said motor and a second check valve for directing fluid only from a source of fluid to said chamber, whereby said pump acts as a fluid suspension system, supporting at least a part of the weight of said vehicle on said one wheel, and whereby the loading on said motor of said power consuming load causes said motor to act as a shock absorber to said pump.

4,295,539

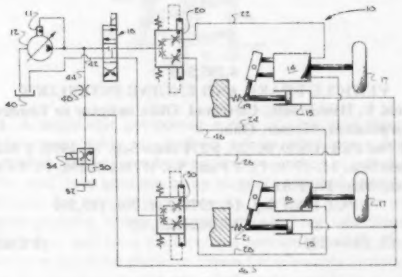
AUXILIARY DRIVE SYSTEM

Richard A. Beck, West LaFayette, and Glen T. Presley, Angola, both of Ind., assignors to Parno Corporation, Brookston, Ind.

Filed Dec. 5, 1979, Ser. No. 100,426

Int. Cl.³ B60K *25/04*

U.S. Cl. 180—243 **11 Claims**



1. A hydraulic auxiliary drive system for the normally non-driven wheels of a vehicle in assistance with the main drive wheels, comprising:

at least one variable displacement motor having a tiltable swash plate driving at least one of said non-driven wheels;

a variable displacement pressure compensated pump supplying the motor with a constant pressure regardless of the vehicle speed;

spring means biasing each motor swash plate toward zero displacement;

servo means connected to the motor swash plate for varying displacement of the motor;

a pressure source supplying the servo means;

a manually operated pressure control means including a solenoid-controlled variable orifice controlling the pressure level supplied to the servo means to vary the torque output of the normally non-driven wheels; and

control valve means positioned between the pump and motor for disengaging and reversing the auxiliary drive.

5. A hydraulic auxiliary drive system for the normally non-driven wheels of a vehicle in assistance with the main drive wheels, comprising:

at least one variable displacement motor having a tiltable swash plate, said motor driving at least one of said non-driven wheels;

a variable displacement pressure compensated pump having a preset compensating level supplying the motor with a constant pressure regardless of the vehicle speed;

spring means biasing each motor swash plate toward zero displacement;

a first servo means connected to the motor swash plate for increasing the motor displacement;

a second servo means connected to the motor swash plate for decreasing the motor displacement;

a pressure source connected to said first servo means;

a sensing passage connecting the pump outlet with the second servo means;

a pressure operated valve means located in said sensing passage having a first position blocking pump pressure to

the second servo means at all pressure levels above the pressure compensating level of said pump, and a second position opening pump pressure to the second servo means at a preset pressure level below said pressure compensating level of said pump whereby when said pump reaches full stroke and is unable to maintain its pressure compensating level, the pressure operated valve means opens the second servo means to pump pressure causing the motor displacement to decrease its fluid demand; and a manually operated pressure control means controlling the pressure level supplied to the first servo means to vary the torque output of the variable displacement motor.

4,295,540

VEHICLE BRAKE AND ENGINE INTERLOCK

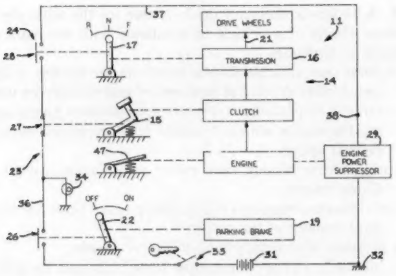
Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US79/00725, § 371 Date Sep. 14, 1979, § 102(e) Date Sep. 14, 1979, PCT Pub. No. WO81/00696, PCT Pub. Date Mar. 19, 1981

PCT Filed Sep. 14, 1979, Ser. No. 117,581

Int. Cl.[3] **B60K** *28/00*

U.S. Cl. 180—271 **14 Claims**



1. In a brake protection interlock system (**23**, **23***a*) for a vehicle (**11**, **11***a*) having ground engaging means (**13**, **13***a*), a brake (**19**, **19***a*), an engine (**12**, **12***a*), and drive delivery means (**14**, **14***a*) for transmitting power from said engine (**12**, **12***a*) to said ground engaging means (**13**, **13***a*), said drive delivery means (**14**, **14***a*) having a transmission (**16**, **16***a*) with at least one nondrive transmitting condition and at least one drive transmitting condition and having a clutch (**18**, **18***a*) which may be engaged and disengaged, and including first means (**29**, **29***a*) for preventing initiation of powered travel of said vehicle (**11**, **11***a*) with said brake (**19**, **19***a*) engaged by suppressing power output from said engine (**12**, **12***a*), the improvement comprising:

second means (**28**, **28***a*) for causing said first means (**29**, **29***a*) to suppress power output from said engine (**12**, **12***a*) in response to said transmission (**16**, **16***a*) being in said drive transmitting condition while both of said brake (**19**, **19***a*) and said clutch (**18**, **18***a*) are engaged, and

third means (**27**, **27***a*) for enabling starting of said engine (**12**, **12***a*) with said transmission (**16**, **16***a*) in drive transmitting condition while said brake (**19**, **19***a*) is engaged by inactivating said second means (**28**, **28***a*) in response to said clutch (**18**, **18***a*) being in disengaged condition.

4,295,541

APPARATUS FOR SUPPORTING LOADS

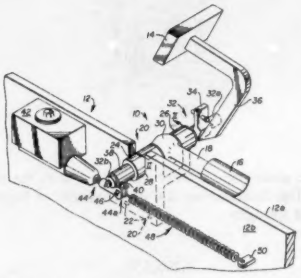
Richard J. Malecha, St. Louis Park, Minn., assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US79/00321, § 371 Date May 14, 1979, § 102(e) Date May 14, 1979, PCT Pub. No. WO80/02550, PCT Pub. Date Nov. 27, 1980

PCT Filed May 14, 1979, Ser. No. 89,116

Int. Cl.[3] **G05G** *1/14;* **74** *512;* **414** *635;636*

U.S. Cl. 180—315 **9 Claims**



1. Apparatus (**10**) for mounting at least one tilt cylinder (**16**, **18**, **30**) and a brake pedal (**14**) for controlling a brake master cylinder (**42**), the apparatus (**10**) comprising:

a frame (**12**) having an inboard side (**12***a*) and an outboard side (**12***b*);

a bracket (**20**) mounted on the inboard side (**12***a*) of the frame (**12**) and having a bifurcated end of first (**24**) and second (**26**) spaced apart hollow ears, the first ear (**24**) of the bracket (**20**) extending to the outboard side (**12***b*) of the frame (**12**);

an elongated sleeve (**52** or **60** or **62**) having first (**52***a* or **60***a* or **62***a*) and second (**52***b* or **60***b* or **62***b*) end portions and a mid-portion (**52***c* or **60***c* or **62***c*), the first (**52***a* or **60***a* or **62***a*) and second (**52***b* or **60***b* or **62***b*) end portions of the sleeve (**52** or **60** or **62**) being supported on the frame (**12**) by the bracket (**20**);

an elongated cross pin (**32**) extending within the sleeve (**52** or **60** or **62**) and the ears (**24**, **26**) and having a first portion (**32***c*), a second portion (**32***d*) and a mid-portion (**32***e*) intermediate the first (**32***c*) and second (**32***d*) portions, the sleeve (**52** or **60** or **62**) and the cross pin (**32**) being constructed to be spaced apart (**58**, **61**, **68**) at the mid-portions (**52***c* or **60***c* or **60***c* and **32***e*) thereof, the tilt cylinder (**16**, **18**, **30**) being rotatably mounted on the sleeve mid-portion (**52***c* or **60***c* or **62***c*) and the brake pedal (**14**) being fixedly coupled to the cross pin (**32**);

means (**38**, **40**, **44**, **46**) for coupling the cross pin (**32**) to the master cylinder (**42**); and

means (**34**, **36**) for coupling the brake pedal (**14**) to the cross pin (**32**).

4,295,542

SEISMIC EXPLORATION WITH DISPOSABLE SEISMIC DETECTORS

H. Neal Reeves; Roy E. Burnett; Leslie R. Denham, and George E. Shields, all of Houston, Tex., assignors to Seiscom Delta Inc., Houston, Tex.

Filed Aug. 27, 1979, Ser. No. 70,241

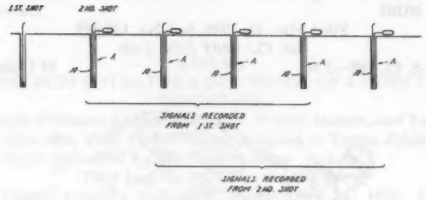
Int. Cl.[3] **G01V** *1/047, 1/13*

U.S. Cl. 181—108 **7 Claims**

1. A method of seismic exploration of subsurface formations, comprising the steps of:

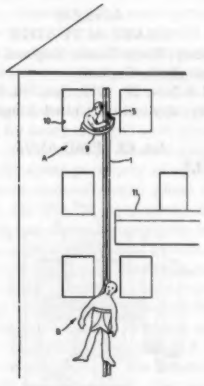
(a) arranging a series of shotholes along a course to be explored in a seismic line of profile above the subsurface formations;

(b) positioning body members, each having both a seismic source and a seismic detector mounted therewith, in the series of shotholes along the course to be explored;
(c) activating one of the seismic sources in a first of the series of shotholes to emit seismic waves;
(d) detecting seismic waves from the subsurface formations with at least some of the remaining detectors located in a plurality of series of shotholes;
(e) activating another seismic source in a shothole subsequent to said step of detecting;



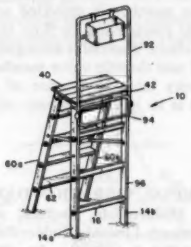
(f) detecting seismic waves from the subsurface formations with the remaining detectors located in a plurality of the shotholes subsequent to said step of activating another seismic source;
(g) activating additional seismic sources in each of a series of shotholes along the seismic line of profile in a predetermined sequence; and
(h) detecting seismic waves from the subsurface waves with the remaining detectors subsequent to each step of activating.

4,295,543
FIRE ESCAPE APPARATUS
Finlay M. Graham, The Coach House, High Rocks La., Tunbridge Wells, England
Filed Feb. 6, 1980, Ser. No. 119,086
Int. Cl.³ A62B 1/20
U.S. Cl. 182—3 **5 Claims**



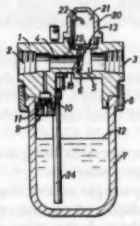
1. In a building, a fire escape apparatus comprising a vertically extending channel member secured to a wall of the building, the channel member defining a channel into which opens a vertical slot, two vertical rows of projections within the channel, each row being disposed adjacent a respective side of the slot and the projections in each row being staggered with respect to those in the other, and at least one harness support capable of being introduced into the channel through the slot and of co-operating with the projections so as to move stepwise down the channel member under the effect of the load applied to the harness support, said harness support including a "T"-shaped member having a cross-piece surmounting an upright, the upright having a projection to which the harness is attached.

4,295,544
PLATFORM STEPLADDER
Donald J. Peterson, 2727 E. Fifth Ave., Knoxville, Tenn. 37914
Filed May 1, 1980, Ser. No. 145,475
Int. Cl.³ E06C 7/18, 1/383
U.S. Cl. 182—106 **3 Claims**



1. A stepladder comprising a pair of elongated front leg members pivotably attached to a front platform, a pair of elongated rear leg members pivotably attached to a rear platform, said front platform being hingedly attached to said rear platform for movement between a coplanar position and a folded position, means for releasably locking said front leg members to said front platform in a position generally perpendicular to said front platform, means for releasably locking said rear leg members to said rear platform in a position in which said rear leg members form an angle of about 110° with said rear platform, a support member pivotally attached to said front leg member and means for securing said support member in a fixed position extending generally perpendicularly upwardly from said front platform including a cylindrical section secured to one of said front legs and a hemi-cylindrical cradle section defined on said support member, adapted to receive said cylindrical section.

4,295,545
LUBRICATOR
Shoki Hiei, Aichi, Japan, assignor to Toyooki Kogyo Kabushiki Kaisha, Okazaki, Japan
Filed Dec. 4, 1979, Ser. No. 100,242
Claims priority, application Japan, Dec. 5, 1978, 53/150723
Int. Cl.³ F16N 7/34
U.S. Cl. 184—55 A **4 Claims**



1. In a lubricator for a pneumatically operated device, comprising:
a housing provided at opposite sides thereof with an inlet port for connection to a source of pneumatic pressure and an outlet port for connection to said pneumatically operated device and provided therein with an air passage for

allowing the flow of compressed air between said inlet and outlet ports, said air passage including a mixture chamber formed at the inlet side thereof with a vertical flat surface wall;

an oil dropping chamber provided on said housing for dropping lubricant into said mixture chamber; and

a throttle valve member of elastic material having a vertical valve port pressed into contact with the vertical flat surface wall of said mixture chamber to be displaced in accordance with the flow quantity of the compressed air through said air passage;

the improvement wherein the vertical valve part of said throttle valve member is provided with an orifice for permitting the compressed air flow therethrough, and a drop tube of elastic material is arranged along the vertical valve part of said throttle valve member and opens at its upper extremity into the interior of said oil dropping chamber and at its lower extremity adjacent to said orifice.

4,295,546

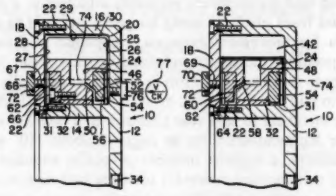
TORSIONAL VIBRATION DAMPERS

Eric M. Vollett, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England

Filed Oct. 2, 1979, Ser. No. 81,192

Int. Cl.³ F16F *15/16*

U.S. Cl. 188—378 **9 Claims**



1. A torsional vibration damper comprising:

an annular hub member adapted for connection to a shaft which is subject to torsional vibrations;

an annular inertia member carried by and journaled for rotation relative to said hub member, at least one surface of the inertia member being in close spaced, face to face relation with at least one opposing surface of said hub member;

a viscous fluid contained between said opposing surfaces so that relative movement shears the fluid to damp torsional vibrations;

variable volume chamber means formed between said hub and inertia members comprising a plurality of a pair of first and second variable volume chambers whose volumes vary inversely in response to relative movement of said inertia member and said hub, said viscous liquid being contained within said variable volume chambers during operation of said damper,

a pocket connected to each of said respective first and second variable volume chambers and being defined by a blind bore, each of said pockets having a gas contained therein which is pressurized by liquid from said chambers when the volume thereof is reduced,

at least one of said members defining a gas reservoir radially inward from said gas pockets;

first and second vent passages connecting said gas reservoir to the pockets of said first and second variable volume chambers, respectively, through the other of said members, said vent passages having restricted cross sectional flow areas; and

a first gas interconnection means connecting the pockets of only said first variable volume chambers and being positioned between said pockets of said first variable volume chambers and one of said first and second vent passages; and a second gas interconnection means connecting the pockets of only said second variable volume chambers and being positioned between said pockets of said second variable volume chambers and the other of said first and second vent passages whereby the gas pockets for each series of variable volume chambers are all interconnected,

whereby a tuning effect is provided for said damper.

4,295,547

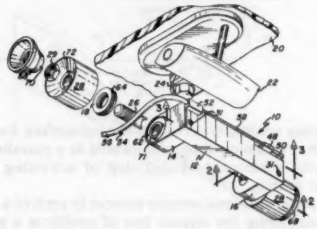
BRAKE ASSEMBLY FOR SMALL VEHICLES

D. Patrick Dungan, 901 Sherman St., #1322, Denver, Colo. 80203

Filed Mar. 31, 1980, Ser. No. 135,869

Int. Cl.³ B60T *1/04, 1/06*

U.S. Cl. 188—2 R **18 Claims**



1. A brake assembly for vehicles having a resilient wheel, comprising: a housing carried by the vehicle; a friction member connected to said housing and adapted to be positioned opposite a first side wall of the wheel for displacement against the wheel side wall; brake assisting means more rigid than the wheel and carried by the vehicle opposite a second side wall of the wheel for limiting the available lateral deformation of the wheel under lateral pressure from the friction member; and means for selectively activating the friction member to be displaced from the housing.

4,295,548

BRAKE ACTUATOR

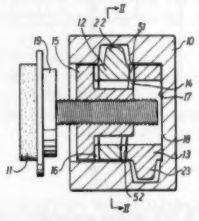
Kenneth M. Quiney, Kings Heath, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 29, 1979, Ser. No. 98,595

Claims priority, application United Kingdom, Dec. 9, 1978, 47852/78

Int. Cl.³ F16D *65/18*

U.S. Cl. 188—72.7 **12 Claims**



1. A brake actuator comprising a body; first and second cam components rotatable in said body and having thereon respective helical cam tracks via which said cam components are in axial co-operative relationship with one another, said cam tracks being complementary to one another and axially confronting one another to form a helical thrust bearing; an output member axially displaceable relative to said body; a first thrust bearing axially operative between said first cam component

and said output member; a second thrust bearing axially operative between the second cam component and said body; and means for rotating both of said cam components relative to said body, the operative relationship between said cam components, said thrust member and said body being such that turning of one of said cam components relative to said body by said rotating means yields a relatively low output force at said output member and turning of the other of said cam components relative to said body, with said one cam component not rotating, yields a relatively high output force at said output member.

4,295,549

ANTI-RUST COVER FOR A DISC ROTOR OF A VEHICLE DISC BRAKE

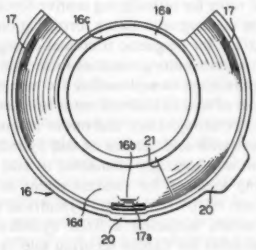
Juichi Shibatani; Kenichi Nakamura; Wataru Izuhara, and Yuichiro Obu, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 18, 1979, Ser. No. 49,748

Claims priority, application Japan, Dec. 26, 1978, 53-178685[U]

Int. Cl.³ F16D *65/00*

U.S. Cl. 188—218 A **14 Claims**



1. In an anti-rusting mechanism, for a disc rotor in a vehicle disc brake, including an anti-rust cover removably attached at the outer periphery thereof to the outer periphery of a dust cover which covers the inner surface of said disc rotor integrally rotatable with a wheel, said anti-rust cover covering the outer surface of said disc rotor to envelope said disc rotor in cooperation with said dust cover, an improvement wherein said anti-rust cover is provided with a plurality of engaging members disposed, for being engaged with the outer periphery of said dust cover, on the surface faced to said disc rotor and in the vicinity of the outer periphery of said anti-rust cover with a predetermined circumferential phase difference from each other, and a plurality of projections disposed on the surface of said anti-rust cover respectively in confrontation with each of said engaging members at a nearer position to the center of said anti-rust cover than said engaging member, and at least one of said engaging members has a recess portion large enough to allow at least a part of a human finger to be held therein when said anti-rust cover is removed, and said anti-rust cover can be removably attached to said dust cover by means of allowing the outer periphery of the latter to fit snappingly between said at least one engaging member and a corresponding one of said projections at each place.

4,295,550

VISCOUS FLUID COUPLING DEVICE

Masaharu Hayashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 21, 1979, Ser. No. 96,329

Claims priority, application Japan, Nov. 28, 1978, 53/147350

Int. Cl.³ F16D *35/00, 43/25*

U.S. Cl. 192—58 B **4 Claims**

1. A viscous fluid coupling device for controlling the revolutions per minute of a radiator cooling fan in response to the temperature of an engine, said coupling device comprising:

a rotor securely fixed to a shaft driven by an engine;

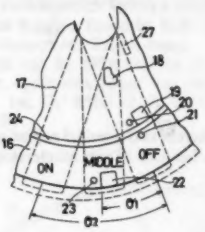
a casing member connected with said shaft for rotation relative thereto;

a cover member connected with said casing member;

a labyrinth formed between projections of said rotor and projections of said casing member;

a closed chamber being formed between said casing member and said cover member and containing said rotor and a quantity of operating oil;

a partition plate dividing said closed chamber into an operating chamber accommodating said rotor and a reservoir



chamber storing said operating oil; a valve plate rotatably attached on said cover member;

said partition plate provided in a first band of circumference thereof with first oil returning means and first pump means, and in a second band of circumference thereof with second oil returning means and second pump means, said second band being entirely radially outside said first band;

thermally responsive means connected with the valve plate to control movement thereof in response to temperature to control the oil returning means and thus control the shear force between the rotor and casing member; and

dam means formed between said first and second bands of circumference.

4,295,551

AUTOMATIC CLUTCH SYSTEM

Frank Zimmermann, Brunswick; Paulus Heidemeyer, and Erhard Bigalke, both of Wolfsburg, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 26, 1979, Ser. No. 61,059

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2833961

Int. Cl.³ B60K *41/02*

U.S. Cl. 192—0.076 **12 Claims**

1. An automatic clutch system, for use in a motor vehicle having an accelerator lever, for selectively connecting the output shaft of a vehicle engine to the input shaft of a multi-speed transmission, comprising:

a clutch mechanism, responsive to supplied signals, for selectively connecting said shafts;

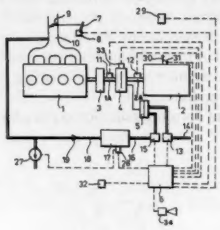
first means for sensing the rotational speed of said engine shaft,

second means for sensing the rotational speed of said transmission shaft;

third means for sensing the position of said accelerator lever;

and control means, responsive to said first, second and third sensing means, for developing said control signals, said control means having a first operating mode, operative when said vehicle is accelerated from a stationary condition, and wherein said control means activates said clutch mechanism

in said first mode to maintain said engine shaft speed within a selected speed range from a selected nominal engine speed



function and wherein said nominal engine speed function is determined as a function of said accelerator lever position.

4,295,552

MEANS FOR COUPLING A HAND DRIVE WITH A ROTATABLE SHAFT

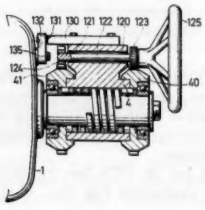
Hans Erlach, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 29, 1978, Ser. No. 920,287

Claims priority, application Switzerland, Jul. 15, 1977, 8831/77

Int. Cl.³ F16D *11/06*

U.S. Cl. 192—81 C **27 Claims**



27. A hand drive for mounting on a rotatable shaft, said drive comprising

a sleeve mounted concentrically about a shaft to define an annular gap therewith;

a helical spring concentrically within said sleeve and having convolutions radially biased into engagement with said sleeve;

a pair of entraining elements rotatably mounted on opposite ends of said sleeve, each said element being entrained with an opposite end of said spring and having external teeth thereon;

a hand wheel having a spindle passing through said sleeve;

a pair of pinions mounted on said spindle, each pinion being in meshing engagement with a respective entraining element; and

means for securing said sleeve to a fixed member.

4,295,553

ELECTROMAGNETIC CLUTCH

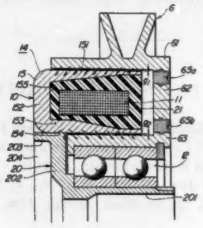
Kosaku Sayo, Katsuta; Atsushi Suginuma; Hideo Tatsumi, both of Mito, and Hisanobu Kanamaru, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,259

Claims priority, application Japan, Jan. 8, 1979, 54-307

Int. Cl.³ F16D *27/10*

U.S. Cl. 192—84 C **11 Claims**



1. In an electromagnetic clutch comprising:

a cylindrical rotor for introducing motive force from a drive source into the magnetic clutch formed at one end thereof with a surface for magnetic frictional engagement;

a motive force transmitting member located in spaced apart juxtaposed relation to said surface for magnetic frictional engagement of said cylindrical rotor and having a surface adapted to be brought into and out of magnetic frictional engagement with said surface of said cylindrical rotor;

a rotary shaft mechanically connected to said motive force transmitting member for rotation about an axis aligned with the axis of rotation of said cylindrical rotor;

energizing means including a fixed cylindrical casing, a holding member for fixedly securing said cylindrical casing in a predetermined position and a winding housed in said cylindrical casing, said energizing means being located in spaced juxtaposed relation to a surface of said end of said cylindrical rotor opposite to said surface thereof adapted to be brought into and out of magnetic frictional engagement with said motive force transmitting member, said cylindrical casing including a cylindrical outer wall and a cylindrical inner wall disposed in spaced juxtaposed relation to cylindrical walls of said cylindrical rotor and extending toward said motive force transmitting member, said cylindrical outer wall and said cylindrical inner wall each having as seen in cross section a planar surface on the side thereof which faces one of said cylindrical walls of said cylindrical rotor and a surface inclined at an acute angle with respect to said planar surface on the side of the wall which faces the winding so that the outer and inner cylindrical walls taper in the direction toward said motive power transmitting member, said motive power transmitting member being magnetically attracted into engagement with said surface of said cylindrical rotor when a current is passed to said winding to transmit motive force from said cylindrical rotor to said rotary shaft;

the improvement comprising a first portion of said cylindrical casing of said energizing means forming a bottom of said cylindrical casing interconnecting said cylindrical outer wall and said cylindrical inner wall at ends thereof remote from said motive force transmitting member, and a second portion of said cylindrical casing contiguous with said first portion and extending upwardly from said first portion along the cylindrical wall and beyond a portion of said inner wall which contacts with the holding member, said first portion and said second portion being substantially equal to each other and larger than other portions of the cylindrical walls of said cylindrical casing in thickness.

4,295,554

CENTRIFUGAL FRICTIONAL CLUTCH

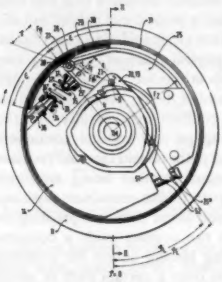
Walter Schlagmüller, Schwieberdingen, and Rudolf Babitzka, Kirchberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,163

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837922; Jul. 10, 1979, 2927730

Int. Cl.[3] F16D *43/14*

U.S. Cl. 192—105 CE 16 Claims



1. A centrifugal frictional clutch including a housing rotatable about a first axis; a frictional member arranged about said housing concentrically with said first axis; a weight lever rotatably supported on said housing to rotate in response to a centrifugal force about a second axis radially spaced apart from said first axis; spring means supported on said housing to act on said lever against the direction of the centrifugal force; a coupling jaw rotatably supported on said weight lever for rotation about a third axis and being engageable with said frictional member, said second and third axes defining a connection line forming with the resultant normal line of action of the force of friction between said jaw and said frictional member an angle γ which corresponds to the angle of static friction between said jaw and said frictional member.

4,295,555

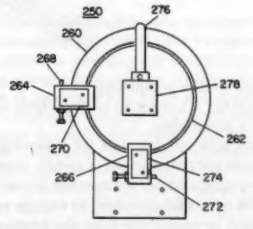
LIMIT SWITCH ASSEMBLY MANUFACTURING MACHINE

Lawrence J. Kamm, 2775 Kurtz St., San Diego, Calif. 92110

Division of Ser. No. 752,107, Dec. 20, 1976, Pat. No. 4,137,432, which is a division of Ser. No. 468,260, May 10, 1974, Pat. No. 3,998,316. This application Dec. 6, 1978, Ser. No. 967,059

Int. Cl.[3] F16D *71/00*

U.S. Cl. 192—139 2 Claims



1. A rotary motion module for imparting controlled, rotary motion to an element comprising, in combination:

a rotary cylinder including a housing and a rotor,

controllable drive means which, when energized, drives the rotor of the rotary cylinder,

clampable module support means secured to the housing of the rotary cylinder,

an arm secured to the rotor of the rotary cylinder,

limit means secured to the housing of the rotary cylinder at a predetermined position around the rotor in the path traversed by the arm when the drive means is energized,

control means responsive to the arm contacting the limit means to provide a control signal indicating that the arm has contacted the limit means, and

module output clamp means secured to the rotor to support the element to be moved and adapted to receive the clampable module support means of the rotary motion module, whereby a plurality of rotary motion modules may be connected in a chain to form a compound motion machine.

4,295,556

PASSENGER CONVEYOR

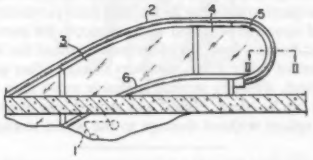
Cyuichi Saito, and Katsuya Teranishi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1979, Ser. No. 32,756

Claims priority, application Japan, Apr. 24, 1978, 53-47746

Int. Cl.[3] B65G *15/00, 9/14*

U.S. Cl. 198—325 4 Claims



1. A passenger conveyor comprising a plurality of steps each including a treadboard provided with a number of cleats and grooves defined therebetween, the cleats being adapted to mesh with teeth of a comb-like plate provided at each terminal of said conveyor, and a frame to which said treadboard is secured; handrails adapted to run in synchronism with the travel of said steps; handrail frames disposed beneath said handrails; and balustrade panels, wherein said treadboard is formed of a corrugated stainless steel sheet and is reinforced by at least one reinforcement member attached to the underside of said treadboard, comb-like end pieces are attached to the leading and trailing ends of said treadboard, each end piece including a plurality of projections extending and fitted into the vacant spaces formed under said cleats of said treadboard, cleat sections extending substantially in alignment with the cleats of said treadboard, and a frame section secured to said reinforcement member, wherein said handrail frame is formed by first and second members both made of stainless steel sheets and having U-shaped cross-sections, said first and second members being welded together in back-to-back relationship so that the open side of said first member is directed toward said handrail while the open side of said second member is directed toward said balustrade panels, and wherein said comb-like end pieces are made of a colored plastic material to mark dangerous zones of the step.

4,295,557

APPARATUS AND METHOD FOR ALIGNING ELONGATED LIGNO-CELLULOSIC STRANDS INTO PARALLELISM

Roland Etzold, Mountain View, Calif.; Julius S. Impellizzeri, New York, N.Y., and Thomas W. Vaughan, Mountain View, Calif., assignors to Elmendorf Research, Inc., Palo Alto, Calif.

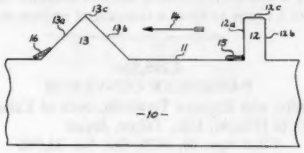
Filed Mar. 17, 1977, Ser. No. 778,412

Int. Cl.[3] B65G *47/14*

U.S. Cl. 198—382 6 Claims

1. Apparatus for orienting wood strands into parallelism comprising: a group of elongated spaced, generally parallel guide members presenting open top spaces therebetween and

defining the side boundaries for the spaces; means coupled with the guide members for moving each pair of adjacent guide members in opposite directions relative to each other and longitudinally of the spaces, said group having spaced first and second projections thereon, each first projection having an end edge extending upwardly from and substantially perpendicular to the upper margin of a corresponding guide member, each second projection having an inclined edge extending upwardly from the upper margin of a corresponding guide



member, the end edge of each first projection being operable to engage and move a wood strand in the direction of movement of the corresponding guide member, the inclined edge of each second projection defining an inclined path permitting one part of a wood strand to be raised with respect to the corresponding guide member as a function of the movement of the latter when projections of other guide members engage other parts of the wood strand, whereby strands spanning more than two guide members can be tilted, turned and moved into alignment with adjacent spaces without damage to the wood strands.

4,295,558

DEVICE FOR CONVEYING CONTAINERS

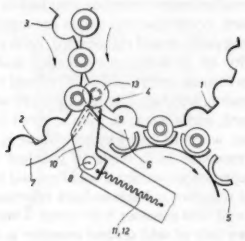
Werner Heckmann, Dortmund, Fed. Rep. of Germany, assignor to Holstein und Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,626

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853696

Int. Cl.³ B65G *47/22*

U.S. Cl. 198—440 **1 Claim**



1. A device for conveying containers into separate paths comprising at least two conveyor wheels mounted for rotational movement and having circular recesses in their circumferential peripheries for receiving and conveying containers when said wheels are rotated, said wheels being arranged to rotate and having a location at which said wheels are arranged tangentially of each other to define a transfer region wherein a circular recess in the circumferential periphery of each conveyor wheel registers with a corresponding circular recess in the other said conveyor wheel so that a container is held in the registering recesses whereby containers can be conveyed selectively over either a main path of movement downstream from said transfer region on one of said conveyor wheels for containers to be used or a shunt path of movement downstream from said transfer region on the other one of said conveyor wheels for containers to be removed, and a pair of tongue members located downstream of the location of tangency of said wheels in the path of containers leaving the location of tangency and each said tongue member being mounted for individual pivotal movement from a neutral position in the vicinity of said transfer region whereat said tongue members confront said containers, said pair of tongue members being supported separately from said wheels and being spring biased into the neutral position confronting oncoming containers, said tongue members comprising an elongated first tongue member and an elongated second tongue member, each said first and second tongue member having a first end arranged to contact the containers and a second end spaced out of contact with the containers with the elongated direction of said first and second tongues in the neutral position extending tangentially of said conveyor wheels at the location of tangency, the first end of first tongue member being wedge-shaped with the wedge-shaped surfaces conforming generally with the contour of said containers to engage and confine containers moving along either one of said paths to said circular recesses, the first end of said second tongue member being arranged in the neutral position in the path of the containers positioned along one of said main path and shunt path and pivoting out of the neutral position due to the contact with a container and pivoting against the spring biasing action for confining the container within the recess over a certain path of movement of the respective conveyor wheel and when the certain path of movement has been traversed said second tongue member is spring biased back into the neutral position, and a common bearing axle pivotally mounting both of said first and second tongues thereon adjacent the second ends thereof.

4,295,559

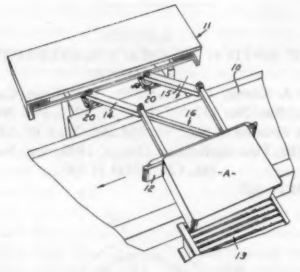
CONVEYOR SYSTEM WITH DIVERTER

Warren D. Neal, and Robert N. Nicodemus, Jr., both of Walkersville, Md., assignors to Acco Industries Inc., Trumbull, Conn.

Filed Jan. 31, 1980, Ser. No. 117,368

Int. Cl.³ B65G *47/34, 47/82*

U.S. Cl. 198—598 **18 Claims**



1. A conveyor system comprising

a conveyor having a horizontal surface upon which articles move past a given area,

diverter means adjacent said area for removing said articles from the conveyor comprising a paddle member,

means for mounting said paddle member for movement in an arcuate path over said conveyor to engage articles on the conveyor and remove them from the conveyor,

and means for operating said last-mentioned means in a cycle,

said last-mentioned means including anti-backup ratchet means operable to hold the paddle member in a predetermined position alongside the conveyor, a drive shaft, said ratchet means being mounted on said frame and operating on said drive shaft and a linear type air motor operable on the drive shaft.

4,295,560

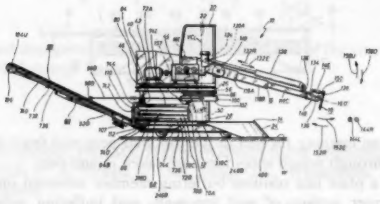
MATERIAL HANDLING APPARATUS

Billy J. Cross, 3316 Cedar Crest, Pasadena, Tex. 77503, assignor to Billy J. Cross, Pasadena, Tex.

Continuation-in-part of Ser. No. 949,736, Oct. 10, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 69,732

Int. Cl.³ B65G *65/10*

U.S. Cl. 198—517 **63 Claims**



1. A material handling apparatus comprising:

a chassis;

a material conveyance surface mounted for a predetermined rate of rotation with respect to the chassis; and

a loading boom having a loading device at the end thereof, the boom being mounted to but extendable from the chassis for loading material onto the material conveyance surface, and the boom being rotatable in a horizontal plane about a vertical axis which extends from the chassis and is coincident with the axis of rotation of the material conveyance surface to dispose the loading device at any angular position in a predetermined sector of the horizontal plane measured from the vertical axis.

4,295,561

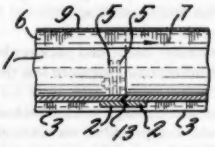
CONVEYOR WITH SCRAPERS

Masaru Yasukawa, and Soji Yasukawa, both of 122, Sanmaiden-cho, Tenrishi, Nara, Japan

Filed Jul. 18, 1977, Ser. No. 816,756

Int. Cl.³ B65G *19/28*

U.S. Cl. 198—735 **4 Claims**



1. A conveyor disposed adjacent a machine tool comprising a plurality of interconnected chutes for transporting machining refuse, said chutes in combination comprising a channel-like vessel having upright side walls, a concave bottom extended therebetween at the lower end and a cover extended therebetween at the upper end, said cover having a plurality of spaced openings therein through which said refuse may be introduced to said chutes, supporting bases for said vessel affixed to the exterior of said concave bottom, said supporting bases including means for connecting adjacent chutes, guide means for supporting an endless chain interconnecting all of said chutes, said guide means being secured to one of said upright walls, and said guide means being a channel bar positioned about said endless chain with its opening facing downward, a plurality of spaced scrapers affixed to said endless chain for moving said refuse in said chutes, each said scraper having a configuration substantially the same as the configuration of the bottom portion of said chutes, drive means for said endless chain to continuously move it in one direction, the end faces at the interface between adjacent interconnected chutes being slanted oppositely to the advancing direction of said scrapers, underlaid supporting bands at each end of each chute positioned to abut the underlaid bands of each adjacent chute, the end faces at the interface between adjacent underlaid bands being slanted in the same direction as the advancing direction of said scrapers, whereby each end of each chute has a V-shaped configuration which cooperatively engages with the opposed V-shaped end of the next adjacent chute.

4,295,562

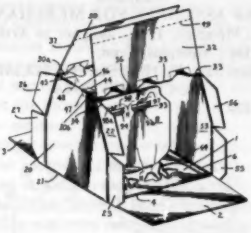
ARTICLE CARRIER AND BLANK THEREFOR

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 7, 1980, Ser. No. 109,768

Int. Cl.³ B65D *5/16, 5/46, 5/54*

U.S. Cl. 206—158 **23 Claims**



1. An article carrier comprising a bottom wall (**1**), side wall means (**2,3,32,37**) secured to the side edges of said bottom wall, a pair of end walls (**20,53**) secured respectively to the ends of said bottom wall, a top panel (**30**) secured to said side wall means and said end walls and disposed substantially parallel to said bottom wall, and characterized by a secondary bottom panel (**6**) disposed in flat face contacting relation with the upper surface of said bottom wall, and handle means (**8,11**) struck at least in part from said secondary bottom panel and secured thereto and disposed substantially perpendicular thereto.

4,295,563

PACKAGING SHEATH WITH CONTENTS

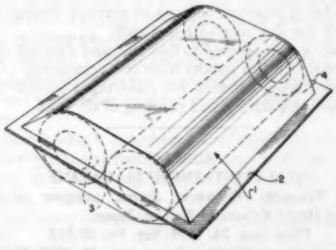
Reinhold Becker; Wolfgang Michel, and Gerhard Hartmann, all of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 26, 1980, Ser. No. 134,313

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912720

Int. Cl.³ B65D *81/18, 81/22, 81/24, 85/08*

U.S. Cl. 206—205 **11 Claims**



1. An article of manufacture, comprising: a hollow rod comprised of a longitudinally gathered tube of cellulose hydrate-based material, said hollow rod having a latent water

content of between about 25% and 100% by weight based upon the total weight of the hollow rod and being free of chemical anti-bacteriocidal agents;

a closed, substantially gas impermeable packaging sheath having a hollow interior chamber therein, said hollow rod being positioned in said hollow interior chamber, whereby the hollow rod is completely enveloped by said packaging sheath, said packaging sheath being comprised of a flexible film of material which is substantially impermeable to gases; and

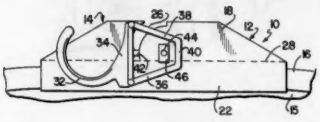
a protective gas essentially filling the remaining portion of said hollow interior chamber, said gas protecting said hollow rod against the formation of aerobic microorganisms on said water-containing cellulose hydrate-based material of said hollow rod.

4,295,564

HANGER ASSEMBLY FOR MERCHANDISE

Fred J. Miller, Memphis, Tenn., assignor to Arthur Fulmer of Mississippi, Inc., Memphis, Tenn.

Filed Jan. 18, 1980, Ser. No. 113,332
Int. Cl.³ B65D *85/18*
U.S. Cl. 206—279 **4 Claims**



1. A hanger assembly for displaying merchandise, comprising:

a label including a pair of juxtaposed flaps adapted to receive therebetween merchandise to be displayed, and a normally upstanding tab secured to at least one of said flaps and extending above said merchandise;

structure defining an arcuate slot in said tab;

a hook for suspending said assembly and merchandise;

means pivotally mounting said hook to said tab for selective movement of the hook between an upright operative position and a lowered, recessed position below the upper margin of the tab,

said slot being configured and arranged to accommodate pivoting of said hook between said positions,

said hook and mounting means therefor comprising—

an arcuate section having a base;

a pair of spaced apart marginal legs secured to the base of said arcuate section and extending away from the same;

a segment connecting the ends of said marginal legs remote from said arcuate section;

a central leg disposed between said marginal legs and extending away from said section;

a laterally extending stub secured to the end of said central leg remote from said section for defining a pivot axis for said hook,

there being structure defining an aperture through said at least one flap receiving said stub;

retainer means secured to said stub and adjacent the face of said one flap remote from said central leg,

said slot being oriented for receiving a portion of said central leg during said pivoting of the hook.

4,295,565

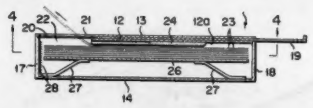
FILM CONTAINING MAGAZINE

Kiyoyuki Takeuchi, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 24, 1979, Ser. No. 69,512
Claims priority, application Japan, Aug. 31, 1978, 53/106449
Int. Cl.³ B65D *85/30, 83/08*
U.S. Cl. 206—455 **10 Claims**

1. A film containing magazine for containing a number of sheet films in a stack for use in an X-ray photographing machine, comprising:

(a) top and bottom walls and paired side walls arranged along the longitudinal axis of the magazine, and front and back walls arranged crosswise of the longitudinal axis, those components cooperatively defining a space containing a number of films;



(b) an opening formed in the top wall near said front wall, through which sheet films are taken in and out;

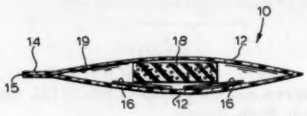
(c) a plate like resilient buffering member mounted on the inner surface of said top wall, said buffering member including a pair of spaced arm sections extending longitudinally of said magazine and to said opening.

4,295,566

AIR-EVACUATED PACKAGE WITH VACUUM INTEGRITY INDICATOR MEANS

Robert C. Vincek, Clifton, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed May 7, 1980, Ser. No. 147,698
Int. Cl.³ B65D *81/20;* G01L *19/12*
U.S. Cl. 206—457 **9 Claims**



1. An evacuated article-containing package assembly with vacuum integrity indicator means comprising:

an air-impervious, flexible package having an access for the placement of an article therein;

an article inside said package;

a compressible member inside said package being compressible under the influence of pressure less than atmospheric pressure; and

a closure seal on said package sealing said access after said article and said compressible member are within said package under air-evacuated conditions, said sealed package being air-evacuated, said compressible member adapted to expand against said flexible package to thereby outwardly expand said flexible package if the pressure inside said package should substantially equal the pressure outside said package, said expanded flexible package thereby serving as a visual indicator that there is no vacuum condition inside said package.

4,295,567

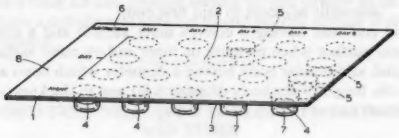
MEDICAMENT CONTAINER

Eric T. Knudsen, Cobham, England, assignor to Beecham Group Limited, England

Filed Nov. 9, 1979, Ser. No. 92,922
Claims priority, application United Kingdom, Nov. 10, 1978, 44099/78
Int. Cl.³ B65D *83/02, 85/56;* G09F *3/08*
U.S. Cl. 206—534 **9 Claims**

1. A pharmaceutical dispensing container, which contains two dosage units which are symptomatic treatments for respiratory tract disorders, the first of these dosage units being

non-sedative, and the second of these dosage units being sedative, and an indicia for distinguishing between said first and



second dosage units is provided on at least one of the container and said dosage units.

4,295,568

PRESSURE FRAME WITH BOWED SIDE MEMBERS

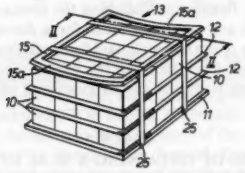
Kenneth S. E. Orpen, 2 Oak Lodge La., Westerham, Kent, England

Filed Aug. 8, 1979, Ser. No. 64,825

Claims priority, application United Kingdom, Aug. 15, 1978, 33352/78

Int. Cl.³ B65D *19/00*

U.S. Cl. 206—597 **13 Claims**



1. A holding frame as hereinbefore defined, for use in securing a stack of articles together, wherein two side members at opposite sides of the frame are bowed, the flange-defining parts thereof being upwardly concave when the frame is disposed horizontally, flange uppermost, the frame being elastically deformable whereby the bowing and tilting of the said two side members is reduced when force is applied to the other side members which reduces the tilting of the latter side members.

4,295,569

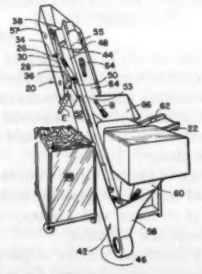
APPARATUS FOR SORTING TEXTILE BOBBINS

Kurt W. Niederer, Charlotte, N.C., assignor to The Terrell Machine Company, Charlotte, N.C.

Filed Sep. 25, 1979, Ser. No. 78,700

Int. Cl.³ B07C *5/04*

U.S. Cl. 209—634 **32 Claims**



1. An apparatus for sorting textile bobbins into groups comprises respectively of empty bobbins and bobbins having residual yarn wrapped thereabout, comprising:

(a) sorting conveyor means having a yarn engaging surface and being arranged for upwardly inclined movement of said yarn engaging surface for upward conveyance and discharge therefrom of bobbins having residual yarn wrapped thereabout by engagement of the yarn by said yarn engaging surface and for downward sliding discharge therefrom of empty bobbins,

(b) means for driving said sorting conveyor means, and

(c) means for feeding bobbins onto said sorting conveyor means including transporting conveyor means passing closely adjacent said sorting conveyor means and being higher than said sorting conveyor means at the location of adjacency for transporting bobbins to the location of adjacency and depositing said bobbins at said location onto said sorting conveyor means, bobbins being carried on said transporting conveyor means in generally axial alignment with the longitudinal extent thereof, said bobbin feeding means including side wall means extending between said transporting conveyor means and said sorting conveyor means, said side wall means having an opening therein at the location of adjacency of said transporting conveyor means to said sorting conveyor means, and said transporting conveyor means being oriented in cross-section at the location of adjacency thereof to said sorting belt means at a downward incline toward said side wall means such that bobbins being transported along said transporting conveyor means move toward said side wall means and fall through said opening therein onto said sorting conveyor means.

4,295,570

AUTOMATIC SELECTION AND DELIVERY APPARATUS OF ASSEMBLED MECHANICAL PARTS

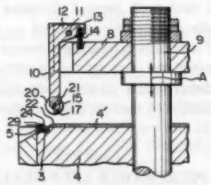
Tsutomu Hakoi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 21, 1979, Ser. No. 105,939

Claims priority, application Japan, Dec. 26, 1978, 53-161534

Int. Cl.³ B07C *9/00*

U.S. Cl. 209—657 **6 Claims**



1. An automatic selection and delivery apparatus for assembled mechanical parts which comprises:

a base having at least one recess for receiving an assembled body the correctness of which is to be detected;

a first delivery arm having an end which includes a portion for engaging a projection which will exist on a correctly assembled body but not on an incorrectly assembled body;

said end being made to move over said base along said recess,

said base having a disk-shaped configuration and provided about its circumference with a plurality of recesses spaced apart at a fixed angular pitch for receiving assembled bodies,

said base being rotated step-wise by said fixed angular pitch, and

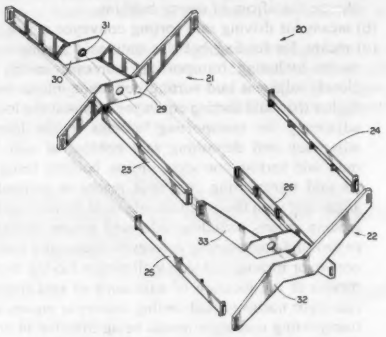
said first delivery arm being driven radially of said disk-shaped base along one of said recesses in said base whenever said base comes to a stop.

4,295,571

FILE FOLDER SUPPORT RACK

Stephen T. Meyer, Carmel, Ind., assignor to Deflecto Corporation, Indianapolis, Ind.

Filed Apr. 27, 1979, Ser. No. 34,174
Int. Cl.³ A47B *3/02*; B42F *15/00*
U.S. Cl. 211—200 **6 Claims**



1. A support device for retaining file folders of the type having a support hook on each corner in a suspended upright orientation, said support device comprising:

two aligned, oppositely disposed end frame members each having a configuration which provides a four-corners arrangement, the upper two corners of each end frame member having substantially the same first distance of separation and the lower two corners of each end frame member having substantially the same second distance of separation, said second distance of separation being different than said first distance of separation, each of said end frame members includes a first offset arm portion and a second offset arm portion pivotally connected to said first offset arm portion at a generally central location, said arm portions being movable with respect to each other between an unfolded offset X-shaped configuration and a folded closed configuration wherein said first distance of separation and said second distance of separation are substantially reduced to zero; and

a plurality of side rails extending between corners of one end frame member and corresponding corners of the other end frame member, each of said side rails having an edge portion suitable to receive said support hooks.

4,295,572

CANNULA PIERCEABLE SELF-SEALING CLOSURE

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Division of Ser. No. 942,113, Sep. 13, 1978, Pat. No. 4,226,333, which is a division of Ser. No. 880,474, Feb. 23, 1978, Pat. No. 4,136,794, which is a division of Ser. No. 729,643, Oct. 5, 1976, Pat. No. 4,111,326, which is a continuation-in-part of Ser. No. 663,921, Mar. 4, 1976, abandoned. This application May 8, 1980, Ser. No. 147,948
Int. Cl.³ B65D *39/04*
U.S. Cl. 215—247 **1 Claim**

1. A cannula pierceable, self-sealing, gas proof closure for sealing an open end of an air evacuated blood collection tube, which comprises:

(a) a tubular elastomeric body having

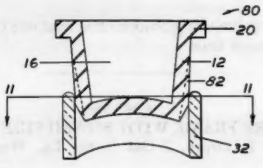
(i) flexible, elastic sidewalls;

(ii) an open first end; and

(iii) a closed second end formed by a cannula pierceable, flexible, elastic end wall integral with said sidewalls; said sidewalls bearing a plurality of grooves in the outer surface thereof and in the direction of the vertical axis of said closure; and

(b) a flange disposed radially about the periphery of said sidewalls adjacent to said first end;

said end wall having a convex inner surface and a concave outer surface when pressure on inner and on outer surfaces is equal, said tubular body having a diameter which bears a ratio to the height of the body of about 0.8:1 and to thickness of the second end of from 5.4:1 to 12.1:1;



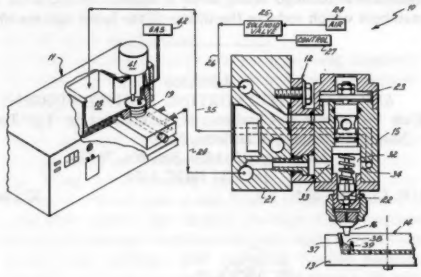
whereby when the closure is emplaced in and sealing an open end of an air evacuated tube, the higher pressure on the convex inner surface of the end wall as compared to the lower pressure (vacuum) exerting itself on the concave outer surface creates a pressure differential on the end wall, flexing and flattening the concave-convex configuration and creating a radial force directed toward the periphery of the end wall, said force effecting a restraining and sealing force between the closed second end of the elastomeric body and the air evacuated tube.

4,295,573

METHOD OF OBTAINING A SEAL UPON THE INTERIOR SURFACE OF A CONTAINER CLOSURE AND RESULTING PRODUCT

Robert R. Terry, Dunwoody, Ga., and Jacob J. Boone, Vermilion, Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Dec. 21, 1979, Ser. No. 101,502
Int. Cl.³ B65D *53/06*; B32B *5/18*; B05B *7/16*
U.S. Cl. 215—348 **2 Claims**



1. The method of obtaining a seal upon the interior surface of a closure for a container, which method comprises

heating a thermoplastic adhesive material which is solid at room temperature so as to convert said adhesive material to the molten state,

creating a mixture of gas and molten thermoplastic adhesive,

pressurizing said mixture of gas and molten thermoplastic adhesive so as to force said gas into solution with said molten thermoplastic adhesive,

dispensing the pressurized mixture of gas and molten adhesive at atmospheric pressure onto the interior surface of a container closure, whereby said gas comes out of solution with said molten thermoplastic adhesive and forms a

foamed molten adhesive bead upon said interior surface, and

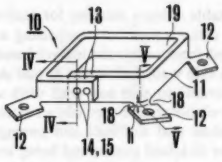
cooling said foamed molten adhesive bead while maintained as a foam on said interior surface of said closure so as to form a cellular seal adhered to said interior surface of said closure.

4,295,574

BANDED-TYPE IMPLOSION PROTECTION CATHODE RAY TUBES

Kooichi Nakazima, Chosei; Keizo Kazama, Mobara, and Hiroshi Oki, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 974,057, Dec. 28, 1978, abandoned. This application May 13, 1980, Ser. No. 149,380
Claims priority, application Japan, Feb. 20, 1978, 53-17664
Int. Cl.³ H01J *31/00*
U.S. Cl. 220—2.1 A **2 Claims**



1. A combination of a cathode ray tube and an implosion protection tension band mounted on the periphery of the face plate of the cathode ray tube, said band comprising an annular reinforcing band which is so shaped, in advance of mounting of the same, as to be fitted to the periphery of the face plate, said annular reinforcing band being formed from an integral stamped flat metal strip, one end of which overlaps the other end substantially parallel to the adjacent periphery of said face plate and having lugs projecting from the edge of said strip; and interfitting means formed at the overlapped ends of said strip, said one end having an integral raised portion and said other end having an integral recess mating with said raised portion and adapted to be engaged for coupling together the opposite ends of said strip in fixed peripheral relation determined by said raised portion and said recess for accurately determining the inner peripheral length of said annular band, and a joint securing said overlapped ends to form said annular band with accurate said inner peripheral length which is sized to be under tension when thermally shrunk fit on said periphery of said face plate.

4,295,575

SURFACE RACEWAY BOX

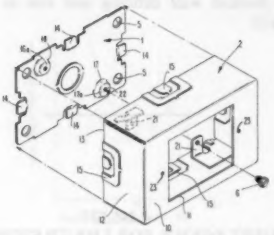
Charles T. Flachbarth, Parkersburg, W. Va., assignor to Butler Manufacturing Co., Kansas City, Mo.

Continuation of Ser. No. 71b,590, Aug. 30, 1976, abandoned. This application Oct. 13, 1977, Ser. No. 841,945
Int. Cl.³ H02G *3/12*
U.S. Cl. 220—3.92 **1 Claim**

1. In a surface raceway box of the known type having a flat base and a hollow, open-ended cover to be secured to the base, the base being for use in mounting the box on a building wall or a like surface and the cover having a top and a continuous wall extending away from the top with the outer edge of the wall forming said open-end and the top also having access opening means providing access to the cover interior, the improvement for securing the cover to the base which comprises:

a pair of spaced bosses on said base, each boss having a raised section including a hole for receiving the threads of a screw, the bosses being dimentioned so that each raised section is spaced away from the base so as to be located inside said cover when the cover is secured to the base in a position close to said outer edge and substantially spaced away from the underside of said top;

a pair of tabs respectively secured to the inside of said cover wall, each tab being located closely adjacent said outer edge and substantially spaced away from the underside of said top and each tab having a screw captured and rotatably mounted thereon, the tabs being located so that when the cover is positioned over the base to be secured thereto the tabs are respectively positioned over and closely adjacent said raised section whereby the screws are respectively aligned with said holes in condition to be turned into threaded engagement for holding the cover secure to the base;



said top access opening means and said captured screws being aligned with said holes in condition to be turned into threaded engagement providing for easy assembly of the cover to the base by that a screw driver can extend through said top access opening means and through the cover interior to contact and turn said screws into said threaded engagement;

the length of each said screw being made so that when the screw is turned into said threaded engagement the screw extends into the boss less than the full depth of the boss; and

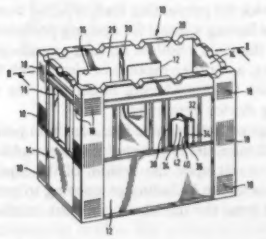
said disposition of said tabs closely adjacent said outer edge providing for single length screws to be employed irrespective of the length of said wall taken between said top and said outer edge.

4,295,576

MOLDED CASE FOR RETURNABLE BEVERAGE BOTTLES

Rudolf F. Steinlein, Munich, Fed. Rep. of Germany, assignor to Alexander Schoeller & Co., AG., Switzerland

Filed Oct. 30, 1979, Ser. No. 89,304
Claims priority, application Canada, Oct. 31, 1978, 315579; Fed. Rep. of Germany, Apr. 12, 1979, 7910849[U]
Int. Cl.³ B65D *1/24*
U.S. Cl. 220—21 **12 Claims**



1. A molded thermoplastic resin case for transporting bottle carriers or minicases filed with beverage bottles or single beverage bottles, including:

a box structure having side walls and a floor; and

at least one separator column extending upwardly from said floor within said box structure, said column being subdivided into partial pillars defining a slot therebetween for receiving therein a dividing wall of a bottle carrier or minicase with bottles contained therein to be inserted into the case;

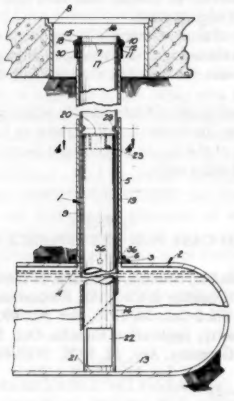
each of said pillars being formed from a web-like, profiled, single wall having opposed inner and outer surfaces, said outer surface of each said profiled wall facing said side walls of said box structure and forming concave, vertically extending bottle contact faces for separating bottles inserted in said box structure, said inner surface of each said profiled wall defining said slot at a top portion thereof.

4,295,577

ANTI-THEFT DEVICE FOR LIQUID STORAGE TANKS

Michael G. Schmid, 5383 North St., Rte. 48, Lebanon, Ohio 45036, and Roger W. Hurt, 5604 Lesourdsville-Westchester Rd., Hamilton, Ohio 45011

Filed May 23, 1980, Ser. No. 152,672
Int. Cl.³ B65D *3/00*; B67C *3/00*
U.S. Cl. 220—86 AT **3 Claims**



1. A device for preventing theft of liquid from a storage tank of the type having a liquid fill opening positioned on the upper surface of the tank, a hollow fill tube extending upwardly from the opening, and filling means associated with the upper end of the fill tube for introducing liquid into the tank, said theft preventing device comprising:

an elongated hollow tube-like stanchion positionable within the fill tube, the lower end of said stanchion being configured to rest upon the bottom of the liquid storage tank, said stanchion including an opening to permit flow of the liquid from the fill tube to the tank interior;

and

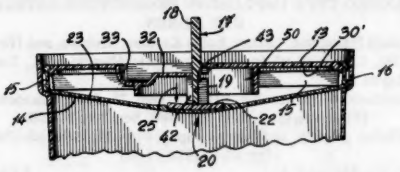
a grid-like baffle plate having a plurality of transversely extending web members forming adjacent openings dimensioned to prevent the introduction of a siphon tube of greater than a predetermined size, attached to the interior of said stanchion.

4,295,578

CONTRACTABLE CLOSURE MEMBER

Daniel Parent, St-Hyacinthe, Canada, assignor to Plastiques Modernes Ltee., Quebec, Canada

Filed Mar. 10, 1980, Ser. No. 128,452
Int. Cl.³ B65D *53/00*
U.S. Cl. 220—234 **20 Claims**



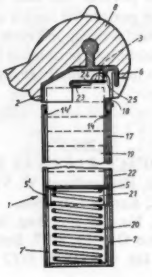
1. A contractable closure member for sealing an open-ended container, said closure member comprising a top wall, a bottom wall formed from an elastic material and having an integral continuous side wall, seal means in said side wall, said side wall being securable to said top wall with said bottom wall held in spaced relationship therewith, a retracting lever pivotally secured below said top wall and having an engagement end and a pusher end, said pusher end being arcuately displaceable against a central portion of said bottom wall to distend said bottom wall whereby said side wall will be drawn inwardly to remove sealing pressure of said seal means when said closure member is positioned for sealing engagement with an open-ended container.

4,295,579

TABLET DISPENSER

Eduard Haas, Vienna, Austria, assignor to Centromint Company Establishment, Vaduz, Liechtenstein

Filed Apr. 7, 1980, Ser. No. 138,224
Claims priority, application Austria, Sep. 26, 1979, 6305/79
Int. Cl.³ B65D *83/04*; B65H *1/00, 1/08*; G07F *11/16*
U.S. Cl. 221—229 **5 Claims**



1. A tablet dispenser comprising a housing part and a tablet storage receptacle part coaxially displaceably mounted in the housing part, the storage receptacle part including a spring biased to press a stack of tablets stored in the receptacle part upwards towards a dispensing end of the receptacle part, one of the parts having an end remaining in contact with the other part in an outer end position of the receptacle part in relation to the housing part, the one part providing a space defining a free play between the parts terminating short of the contacting end, and the other part having a catch arranged close to an end of said other part contacting the end of the one part in the outer end position, a tolerance remaining between the catch and the space, and the catch having a height corresponding to the

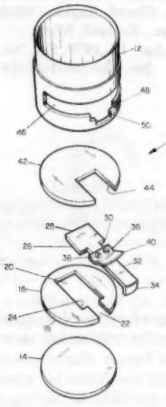
tolerance, a sloping run-up section extending between the catch and the space adjacent the contacting ends.

4,295,580

CLOSURE DISPENSER

Christopher P. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 16, 1979, Ser. No. 66,942
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—268 **1 Claim**



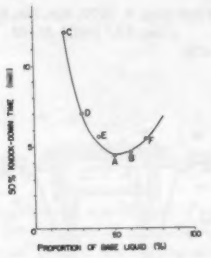
1. A dispenser for a flexible disk shaped closure with an attached rim, including an elongate cylindrically shaped closure storing chamber for storing a vertically oriented stack of closures, a bottom plate positioned adjacent one end of said storing chamber and attached thereto, a slide bar retaining plate positioned next to and in juxtaposed relationship with respect to said bottom plate, an elongated slot, formed with reentrant corners, positioned along a diameter of said slide bar retaining plate, a slide bar positioned and guided for movement within said slot, said movement being limited by engagement of said slide bar with said reentrant corners, a closure engagement foot attached to and positioned intermediate the ends of said slide bar, an upturned edge on said closure engagement foot cantilevered at an angle with respect to said slide bar for engaging the inside rim of a closure, a cover plate containing a slotlike aperture for surrounding a portion of said closure engagement foot, said cover plate positioned adjacent to and above said slide bar, a circumferentially positioned aperture in said storing chamber wall opposite said slot in said slide bar retaining plate, a notch formed in a bottom edge of said aperture for providing specific ingress and egress for said slide bar and its closure engagement foot, said slide bar passing through and movable within said notch so that when said slide bar is moved from an inward to an outward position a closure will be partially withdrawn from said dispenser through said aperture and when said slide bar is moved from an outward to an inward position said cantilevered upturned edge will cam beneath the rim of a closure positioned within said storing chamber and assume a position whereby the next closure can be extracted from said dispenser.

4,295,581

INSECTICIDAL AEROSOL FORMULATION HAVING A LIQUIFIED PETROLEUM GAS PROPELLANT

Takashi Yamaguchi, Nishinomiya; Yoshitoshi Okuno, Toyonaka, and Chuji Hirose, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 857,801, Dec. 5, 1977. This application Mar. 24, 1980, Ser. No. 133,600
Claims priority, application Japan, Dec. 9, 1976, 51-148426
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—192 **1 Claim**



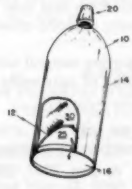
1. An insecticidal aerosol formulation comprising a pressure-proof container equipped with a valve having a housing orifice of 0.46–0.64 mm in diameter, button, stem and vapor tap orifices of 0.33–0.41 mm in diameter wherein the stem orifice diameter ≦ vapor tap orifice diameter ≦ button orifice diameter, filled with a base liquid consisting essentially of at least one pyrethroid type insecticide dissolved in kerosene having a boiling point of 180° to 260° C. and a propellant consisting essentially of a liquified petroleum gas wherein the volume ratio of the base liquid to the liquified petroleum gas is 50:50 to 60:40.

4,295,582

DISPENSING CONTAINER WITH IMPROVED AIR VALVE

Alexander D. Acres, 368 Glenrose Dr., London, Ontario, Canada (N6K 2A8)

Filed Aug. 9, 1979, Ser. No. 65,269
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—213 **5 Claims**



1. An improved air valve for a dispensing container, the container including a resilient housing, a bottom, and a resilient expandable membrane mounted between the housing and the bottom to internally partition the container into an ingredient dispensing chamber and an air chamber, the housing defining an ingredient dispensing orifice that communicates with the ingredient containing chamber, the improvement comprising:

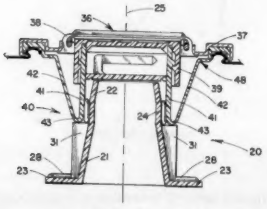
(a) the bottom formed to matingly seal marginal edges of the membrane with peripheral walls of the container, the bottom forming a recess and having an inclined sloped portion, an aperture formed in said inclined sloped por-

tion, the sloped portion forming an acute angle with the housing, whereby on flexing of the housing, a portion of the membrane is caused to be sealingly urged against the aperture and hence to sealingly close the same whereby air in the air chamber is urged against the membrane to urge ingredients in the ingredient chamber out of the ingredient orifice.

4,295,583
CLOSURE CAP VENT

Robert E. Schurr, Garrett, Ind., assignor to Rieke Corporation, Auburn, Ind.

Filed Aug. 9, 1979, Ser. No. 65,183
Int. Cl.³ F65D *25/44*
U.S. Cl. 222—478 **8 Claims**



1. A venting device for use with and secured to a container pour spout of the style having an outer base portion and a smaller inner cylindrical portion with an invertible fold portion therebetween, said venting device arranged to allow the entry of air into the corresponding container at a location exterior to the exiting fluid flow stream, said venting device comprising:

a hollow central body portion having a top end which includes a generally cylindrical section and joined thereto and in end-to-end relationship therewith a frustoconical section, each section extends above said invertible fold portion and into said smaller inner cylindrical portion and said top end of said hollow central body portion is arranged substantially concentric with said container pour spout in a uniformly spaced-apart manner, the resultant space between the outside surface of said top end and the inside surface of said smaller inner cylindrical portion providing a generally annular air flow passageway for entering venting air, said hollow central body portion further comprising a base and an interior passageway extending therethrough, said central body portion tapering inwardly as it extends from said base to said top end resulting in a progressively reduced cross-sectional area; and

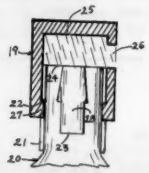
a substantially flat flange portion integral with said base and including a spaced plurality of outwardly radiating ribs.

4,295,584
SIDE DISPENSING CLOSURE

Raymond P. Borowitz, Rte. 6, Box 2067, Escondido, Calif. 92026

Filed Jan. 22, 1979, Ser. No. 5,340
Int. Cl.³ B65D *47/28*
U.S. Cl. 222—519 **1 Claim**

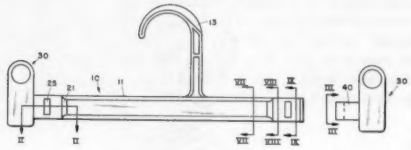
1. A dispensing closure and container comprising: a closure with a top and side wall portion or skirt; said skirt having an opening or openings of any size constructed or molded therein for the dispensing of container's contents; said skirt also having inward facing projections; a container with an open-end neck portion; said neck having external longitudinally extending pillars cooperating with the inward facing projections of the cap skirt to define a guidepath of axial reciprocation; there being at least two pillars forming the guidepath; each pillar having vertically positioned stop lugs to limit the extent of outward opening axial movement of the cap; and alternate pillars having a length less than an adjacent pillar to receive the inward projections of the cap skirt in the inward closed position of the cap upon partial rotation of the cap to seal the cap in the closed position.



4,295,585
MULTI-PIECE HANGER

Judd F. Garrison, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Apr. 16, 1979, Ser. No. 30,287
Int. Cl.³ A47J *51/14*
U.S. Cl. 223—96 **5 Claims**

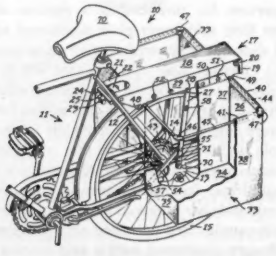


1. An article hanger having a frame and an article engaging member; said frame having means by which it can be suspended, said article hanger characterized in that said article engaging number and said frame are separate components and two-part means are provided for locking said article engaging member and frame together, said means including a track opening through one end of said frame and said article engaging member having a tongue adapted to be slidably and telescopically received in said track, said track and tongue being shaped to hold said article engaging member against rotation in any direction with respect to said frame.

4,295,586
RECEPTACLE SUPPORT APPARATUS FOR BICYCLE

Norman E. Shockley, 1119 Murfreesboro Rd., H-3, Nashville, Tenn. 37217

Filed Jan. 24, 1980, Ser. No. 115,013
Int. Cl.³ B62J *9/00*
U.S. Cl. 224—32 R **8 Claims**



1. A receptacle support apparatus for a bicycle having a rear

wheel and a bicycle frame including a rear fork straddling and connected to the rear wheel, comprising:

(a) a support frame,

(b) means mounting said support frame on said bicycle frame over said rear wheel,

(c) at least one receptacle made of flexible sheet material having a bottom wall, end walls, and inboard and outboard side walls, said end walls and said side walls having upper margins defining an open top,

(d) rod means comprising an outboard rod portion cooperatively engaging the upper margin of said outboard side wall, and end rod portions cooperatively engaging the upper margins of said respective end walls,

(e) each of said end rod portions having inboard end portions and having outboard ends connectable to said outboard rod portions, and

(f) means for detachably mounting said inboard end portions to said support frame.

4,295,587

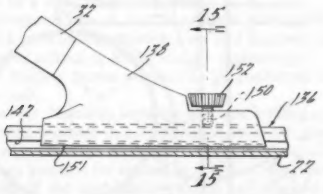
ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES

John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Division of Ser. No. 924,072, Jul. 7, 1978, Pat. No. 4,182,471, which is a division of Ser. No. 743,602, Nov. 22, 1976, Pat. No. 4,099,658, which is a continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. This application Jul. 10, 1979, Ser. No. 56,154

Int. Cl.³ B60R *11/00*

U.S. Cl. 224—321 **6 Claims**



1. In an article carrier for an automotive vehicle,

a plurality of at least two parallel arranged slats fixedly secured on a generally horizontally extending exterior body surface of the vehicle and lying closely adjacent said surface,

each of said slats having major and minor dimensions, with said major dimension being arranged substantially parallel to said body surface,

each of said slats having a clamping surface extending longitudinally on the exterior surface thereof,

an article supporting member mounted on at least one of said slats and having clamping means clampingly engageable with said one slat for securing said member thereto, said clamping means being operable to apply a first vertically downwardly directed force against said one slat and a second vertically upwardly directed force against said one slat and being readily loosened for the movement of said member longitudinally of said slats and for the removal and reattachment of said article supporting member solely at the longitudinal end extremes of said slat.

4,295,588

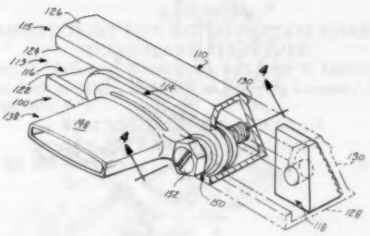
SLOTTED SIDE RAIL AND MOVABLE BRACKET FOR ARTICLE CARRIER

Daniel J. Kowalski, Ortonville, and Ray G. Mareydt, Warren, both of Mich., assignors to Four Star Corporation, Troy, Mich.

Filed Sep. 4, 1979, Ser. No. 71,938

Int. Cl.³ B60R *9/00*

U.S. Cl. 224—321 **2 Claims**



1. An adjustable cross-rail assembly for a vehicle-mounted article carrier of the type including a hollow side rail supported upon a vehicle surface, said rail including transversely spaced inner and outer walls, said inner wall including a longitudinally extending slot, a bracket slidably supported within said slot and including a cross-rail supporting portion projecting transversely inwardly of the inner wall of said side rail and means for releasably locking said bracket to said side rail, the improvement comprising:

(a) said bracket being bifurcated to provide inner and outer portions straddling said side rail slot, a threaded bore formed through said inner and outer portions and extending transversely through said side rail slot;

(b) a member slidably disposed within said side rail and including a recess adapted to be transversely aligned with said bracket bore, said member being transversely spaced outwardly from the outer portion of said bracket and including an outer surface disposed proximate the outer wall of said side rail; and

(c) an element extending through and threadable within said bracket bore and projecting within the member recess whereby rotation of said element in one direction respectively causes the outer surface of said member to engage with the outer wall of the side rail and the outer portion of said bracket to engage with the inner wall of said side rail to adjustably fix the longitudinal position of said bracket relative to the side rail.

4,295,589

DEVICE FOR FEEDING WEB WITH TEMPERATURE COMPENSATING MEANS

Shigenori Oosaka, and Makoto Murakoshi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 22, 1980, Ser. No. 152,190

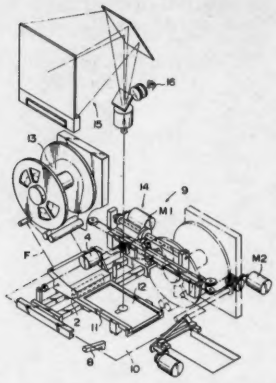
Claims priority, application Japan, May 25, 1979, 54-64623

Int. Cl.³ B65H *17/26*

U.S. Cl. 226—122 **4 Claims**

1. A device for feeding a web comprising a rubber roller for feeding a web, a stepping motor for driving the rubber roller by way of a power transmission means, a pulse generator connected wih the stepping motor for driving the stepping motor by the pulses generated thereby, a temperature detecting means for detecting the temperature of the rubber roller directly or indirectly, and a temperature compensating means for controlling the number of pulses generated by the pulse generator according to the temperature detected by said temperature detecting means in such a manner that the speed of

rotation of said rubber roller is controlled to effect the constant speed of web feeding irrespective of the temperature detected,



whereby the web is fed at a constant speed irrespective of the temperature of the rubber roller.

4,295,590

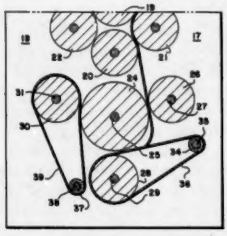
APPARATUS FOR PROCESSING PHOTOGRAPHIC MATERIALS

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Jun. 10, 1980, Ser. No. 158,248

Int. Cl.³ B65H *17/22;* **G03B** *1/56*

U.S. Cl. 226—183 **6 Claims**



1. In apparatus for processing photographic material by conveying an elongated web for turnaround in a confined space comprising

spaced frame members,

means carried by said spaced frame members for directing the web in an arcuate path,

said means comprising an endless web guiding belt for engagement by the leading edge of the web and by the web.

4,295,591

NAIL PRESS

Sten Lundström, Boras, Sweden, assignor to Aktiebolaget SKF, Gothenburg, Sweden

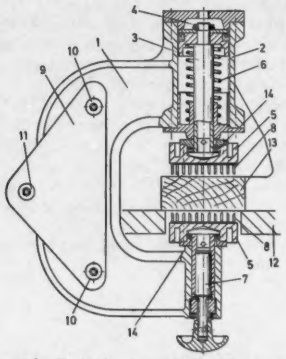
Filed Jan. 22, 1980, Ser. No. 114,251

Claims priority, application Sweden, Jan. 30, 1979, 7900785

Int. Cl.³ B27F *7/15*

U.S. Cl. 227—142 **5 Claims**

1. A nail press assembly comprising a yoke of generally C-shaped configuration, a hydraulic actuated piston mounted at one end of the said yoke, a shaft member aligned with said piston at the opposite end of said yoke, the confronting ends of said piston and shaft member mounting confronting first and second press plates including means for removably supporting first and second nail plates, said first and second press plates



being mounted for limited universal pivotal movement on said piston and shaft member respectively.

4,295,592

APPARATUS FOR JOINING AND CLADDING PIPE SECTIONS

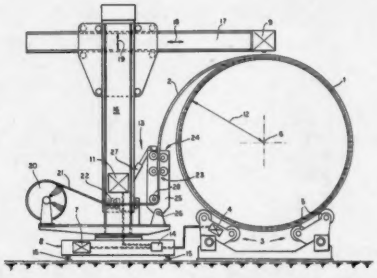
August W. Schäfer, Wilnsdorf-Wilden, Fed. Rep. of Germany, assignor to Wilhelm Schäfer Maschinenbau, Wilnsdorf-Wilden, Fed. Rep. of Germany

Filed Oct. 9, 1979, Ser. No. 82,624

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847966

Int. Cl.³ B23K *37/02, 37/04*

U.S. Cl. 228—17 **6 Claims**



1. An apparatus for joining pipe sections and for forming around the joined pipe sections a helical passage, said apparatus comprising:

means including a cradle for holding two cylindrical pipe sections with their ends abutting axially and their axes coaxial;

means including a roller in said cradle for jointly rotating said sections about said axes with said ends abutting;

a track extending parallel to said axes;

a carriage displaceable axially on said track adjacent said cradle and including an upright post and a horizontal outrigger carried on said post;

means including a primary welding tool on said carriage for welding together the ends of said pipe sections as same rotate;

a supply of flat metal strip on said carriage;

means on said carriage for withdrawing said strip from said supply, bending said strip into a U-section, arcing said

strip to a radius of curvature substantially equal to that of said sections, and helically applying the arced strip to said pipe sections as same rotate with the concave side of said strip turned toward said sections, whereby said strip forms with said sections a helical passage;

means including a secondary welding tool on said carriage for welding the arced strip helically to said pipe sections as same rotate;

means for vertically displacing said outrigger on said post for displacing said tools radially of said axes and for retaining said tools in any of a multiplicity of radially offset positions on said carriage, said tools being downwardly directed and effective, whereby welding is effected at the highest parts of said sections; and

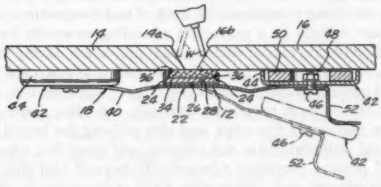
control means connected to all of said means for synchronously axially displacing said carriage on said track and rotating said pipe sections during welding of the arced and U-section strip to said sections.

4,295,593

WELDING SEAM BACK-UP MEANS

Milo M. Kensrue, 601 Lido Park Dr., 8B, Newport Beach, Calif. 92663

Filed Sep. 24, 1979, Ser. No. 78,339
Int. Cl.³ B23K *37/06*
U.S. Cl. 228—50 **12 Claims**



1. A welding seam back-up means for mounting on the back side of the adjacently positioned edge margins of members to be joined by a weld seam, comprising:

a. an elongated tape of flexible material adapted to be positioned in straddling relation over said adjacent edge margins and extending longitudinally therealong;

b. tape holding means adapted to be positioned over said tape; and

c. means for releasably securing said tape holding means and applying pressure in a direction to force the tape against the adjacent edge margins comprising a plurality of attaching brackets for mounting at spaced intervals longitudinally of the tape holding means and adapted to transversely straddle the tape holding means, each of said brackets including:

an elongate longitudinally bowed strap-like spring; and

a magnet connected to each end of said spring;

whereby with the bowed spring engaged between its ends with the tape holding means, the magnets will be initially respectively in spaced relation to the members to be joined by the weld, and upon movement of the magnets into engagement with said members, will deform and activate the bowed spring so as to apply a holding pressure against said tape holding means.

10. A welding seam back-up means for mounting on the back side of the adjacently positioned edge margins of members to be joined by a weld seam, comprising:

a. an elongate tape of flexible material adapted to be positioned in straddling relation over the adjacent edge margins and extending longitudinally therealong;

b. tape holding means comprising an elongate channel member having a low heat sink capability adapted to be positioned over and to receive said tape therewithin and extending therealong;

c. an elongate separate bar of a material having a high heat conducting characteristic positioned in the channel in underlying relation to said tape to provide a high heat sink capability;

d. means for releasably retaining said bar within said channel including a screw rotatably supported in said channel and having threaded engagement with said bar; and

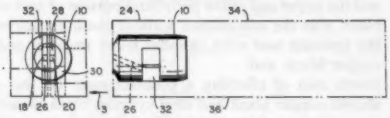
e. means for releasably securing said tape holding means and applying pressure in a direction to force the tape against the adjacent edge margins.

4,295,594

LAMINATED JET PIPE RECEIVER PLUG ASSEMBLY METHOD AND STRUCTURE

Robert D. Nicholson, Birmingham, and Alger T. Daniel, Clawson, both of Mich., assignors to Koehring Company, Brookfield, Wis.

Filed May 22, 1979, Ser. No. 41,494
Int. Cl.³ B23K *1/20;* **B23P** *13/00*
U.S. Cl. 228—160 **8 Claims**



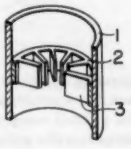
2. The method of manufacturing a receiver plug assembly structure comprising preparing a plurality of plates with openings extending therethrough which are positioned to provide passages through the receiver plug assembly when the plates are positioned adjacent to each other in surface to surface contact, said plurality of plates including at least one centrally located divider plate having spaced apart transverse openings therethrough and at least one port plate positioned on each side of the divider plate having transverse openings therethrough, which openings are aligned with the openings through the divider plate and a transverse opening extending through the end of each of the port plates in communication with separate ones of the aligned openings through the divider plate, placing a brazing compound on selected surfaces of the plates, assembling the plates in surface to surface contact to provide the passages through the receiver plug assembly, subjecting the assembled plates to brazing temperature and pressure to braze them together, and machining the brazed-together plates into the desired exterior form of the receiver plug assembly.

4,295,595

METHOD OF PRODUCING MAGNETRON ANODE

Kuninori Imai, Shiroyamamachi, and Soji Takahashi, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1979, Ser. No. 6,484
Claims priority, application Japan, Jan. 25, 1978, 53-6198; Jan. 27, 1978, 53-7251
Int. Cl.³ B23K *28/02*
U.S. Cl. 228—161 **14 Claims**



1. A method of producing a magnetron anode having a plurality of copper vanes which extend radially inward from the inner peripheral surface of said copper anode toward the center of said copper anode comprising:

a first step of cleaning the outer peripheral surface of a

copper blank and the inner peripheral surface of a straight steel cylinder blank material;

a second step of fitting said copper blank to the inside of said straight steel cylinder blank material so that the cleaned outer peripheral surface of said copper blank and the cleaned inner peripheral surface of said straight steel cylinder blank material contact each other, and then compacting said copper blank to said steel cylinder blank material;

a third step of preheating said copper blank compacted to said steel cylinder blank material and press working said copper blank by penetrating said copper blank with a shaping punch so that said steel cylinder blank material is raised in a direction opposite to the penetration of the shaping punch within a time region between the instant at which the shaping punch contacts said copper blank and the instant at which the shaping flow of said copper blank becomes steady, so as to maintain a constant length between the upper end of said steel cylinder blank material and the upper end of the peripheral portion of said copper blank after the compaction without causing relative sliding between said steel cylinder blank material and said copper blank; and

a fourth step of effecting a post-treatment on the press-shaped copper blank and steel cylinder blank material so as to obtain a tight bonding and desired shape of said anode;

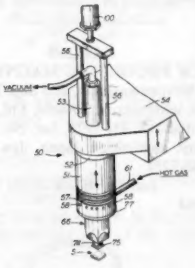
wherein said third step is carried out such that said steel cylinder blank material is made to move upward during said press working, the amount of rise of said steel cylinder blank material in said pressworking of said third step being ((extrusion ratio)−1)×0.7 times as large as the penetration of said shaping punch.

4,295,596

METHODS AND APPARATUS FOR BONDING AN ARTICLE TO A METALLIZED SUBSTRATE

Bradford O. Doten, Hopewell Township, Mercer County, N.J., and John J. Svitak, Lower Makefield Township, Bucks County, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,463
Int. Cl.³ B23K *1/12*; H01S *21/60*
U.S. Cl. 228—180 A **9 Claims**



1. A method of bonding an article to a metallized substrate, at least one of which has a predeposited reflowable bonding material thereon, the method comprising the steps of:

positioning the article on the metallized surface of the substrate;

directing at least one stream of hot gas towards the substrate;

redirecting the gas stream laterally, substantially parallel to the surface of the substrate, towards the article to reflow the material; and

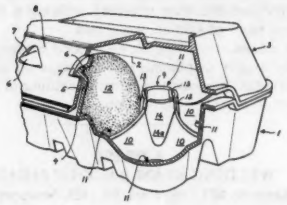
resolidifying the material to form a bond between the article and the metallized surface of the substrate.

4,295,597

TRAY BLANK FOR EGGS

Jorgen N. Petersen, Lyngby, Denmark, assignor to Aktieselskabet Brodrene Hartmann, Lyngby, Denmark

Continuation of Ser. No. 624,965, Oct. 22, 1975, abandoned.
This application Sep. 28, 1977, Ser. No. 837,533
Claims priority, application Denmark, Jan. 27, 1975, 25219/75
Int. Cl.³ B65D *1/24, 85/32*
U.S. Cl. 229—2.5 EC **5 Claims**



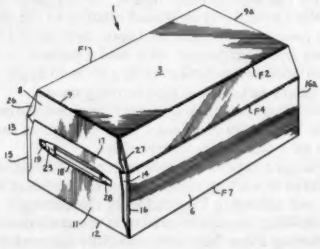
1. A tray blank especially for eggs comprising an egg carrier section and a cover, said carrier section having a plurality of egg-receiving compartments, each of said compartments being in part defined by a projection extending upwardly from the bottom of said carrier section, each projection having an open top, each projection having lateral wall portions, each lateral wall portion having an upper free edge at said open top, at least two slits in each projection, said slits extending downwardly from said upper free edge, said slits defining the lateral extent of said wall portions at and adjacent said upper free edge, each wall portion extending downwardly beyond said slits into a compartment, said wall portion being resilient due to the presence of said slits, said slits being free of engagement with said cover when said cover is in its closed position, said slits also being free when said cover is in its closed position to become reduced in size due to flexing of said wall portions, said wall portions in part defining an egg-receiving compartment only on one side of said wall portions, and the opposite side of said wall portions in part defining a space at all times free of eggs, whereby said wall portions may at all times give to support eggs of different sizes.

4,295,598

CARTON WITH CARRYING STRAP

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 20, 1980, Ser. No. 161,408
Int. Cl.³ B65D *5/46, 25/28*
U.S. Cl. 229—52 AL **15 Claims**



1. An article carton having top, bottom, side and end walls interconnected to form an enclosure which is generally cubical in configuration, means defining an aperture in one of said

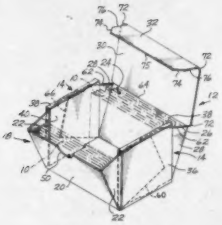
walls, and a carrying strap having an anchoring part disposed entirely within the carton and arranged in enveloping relation to at least a part of an article disposed within the carton, said strap having a handle part normally disposed within the carton and adjacent said aperture and said handle part being accessible for grasping to facilitate carrying the carton.

4,295,599

FILE BOX

John D. Locatelli, 3340 59th Ave. SW., Seattle, Wash. 98116, and Gary M. Gunderson, Seattle, Wash., assignors to John D. Locatelli, Seattle, Wash.

Filed May 16, 1980, Ser. No. 150,343
Int. Cl.³ B65D 5/22
U.S. Cl. 229—34 R **2 Claims**



1. In a file box having a flat, rectangular bottom panel; a pair of hollow side walls extending upwardly from each side edge portion of the bottom panel, the side walls having front and rear entrance openings; an upright front panel pivotally connected along its bottom edge portion to a front edge portion of the bottom panel to enable the front panel to pivot between a closed, substantially vertical position and an open, forward tilted position; an upright rear panel pivotally connected along its bottom edge portion to a rear edge portion of the bottom panel to enable the rear panel to pivot between a closed, substantially vertical position and an open, rearwardly tilted position; and the improvement comprising:

unitary, substantially rigid and flat front sliding panels extending rearwardly from each side edge portion of the front panel to slidably extend through a corresponding side wall front opening a substantial distance into the hollow interior of the side wall;

unitary, substantially rigid and flat rear sliding panels extending forwardly from each side edge portion of the rear panel to slidably extend through a corresponding side wall rear opening a substantial distance into the hollow interior of the side wall to overlap said front sliding panels;

wherein said front and rear sliding panels slide relative to each other within the hollow side walls and said front and rear sliding panels pivot with their corresponding front and rear panels between a closed position wherein said front and rear sliding panels are disposed in maximum overlapping relationship and substantially entirely within a corresponding side wall, and an open position wherein said sliding panels are disposed in substantially overlapping relationship and extend outwardly from the side walls to form, respectively, front and rear extensions of the side walls; and

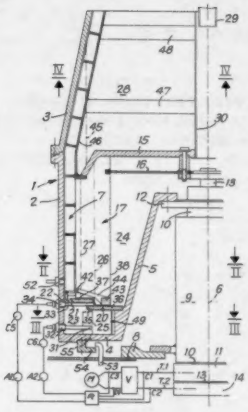
a unitary, substantially rigid, flat top panel having front, rear and side edge portions, said top panel being pivotally connected along its rear edge portion to the top portion of the rear panel to pivot between a first, closed position closely overlying the side walls to substantially close off the top of the file box and second, open position extending upwardly from the rear panel to provide unhindered access to the file box.

4,295,600

APPARATUS FOR THE CENTRIFUGAL SEPARATION OF AT LEAST TWO LIQUID PHASES AND ONE SEDIMENTARY PHASE OF A MIXTURE

Pierre L. Saget, 36, avenue de la Grande Armee, Paris, France (75017)

Filed Feb. 19, 1980, Ser. No. 122,472
Claims priority, application France, Feb. 23, 1979, 79 04748
Int. Cl.³ B04B 1/04, 1/20
U.S. Cl. 233—7 **11 Claims**



1. An improved apparatus for the centrifugal separation of at least two liquid phases and one solid sedimentary phase from a mixture, the said apparatus comprising: a rotating enclosure, first rotational means for rotating said enclosure, said rotating enclosure disposed around a nozzle supplying the mixture to be treated, said rotating enclosure being closed by a coronal base and coupled to said first rotation means for driving it in rotation, the said enclosure being integral with an angular partition therein which plunges into the mixture beyond the interface of the phases thereof, said partition separating a first chamber in said enclosure containing only the heavy phase from a second chamber in said enclosure containing the light phase "floating" on the heavy phase, said partition providing a peripheral annular passage for the transfer of the said heavy phase from the second chamber towards the first chamber, said first chamber being defined by a peripheral wall, said coronal base and said partition wall, the enclosure further presenting separate thresholds for the draining of the phases, a helical sediment conveyor within said enclosure, a second rotation means coupled to said conveyor via a plate which plunges into the mixture beyond the said interface, said plate separating the second chamber from a cavity in said enclosure with which said second chamber communicates on the periphery via a space near the conveyor for transferring the sediments through the heavy phase,

a first centrifuge device housed in the first chamber and integral with said peripheral wall, said partition wall and said base thereof provided with surfaces extending inside the entire treated volume, across their circular movement, in order to transmit the rotation of the first driving means to the heavy phase according to an angular speed which is scrupulously constant throughout its whole mass and in every one of its points;

a second centrifuge device housed in the second chamber and integral with said plate and with said conveyors, said second centrifuge device plunging at least into the light phase of the second chamber, said second centrifuge device extending along the said second chamber to arrive as close as possible to the partition wall, to the light phase draining threshold and to the annular passage of the heavy phase, and being provided with surfaces extending

through the entire treated volume, across their circular movement, in order to transmit the rotation of the second driving means to at least the light phase, according to an angular speed which is scrupulously constant throughout its whole mass and in every one of its points, thus opposing the natural tendency of this type of flow with constant angular speed to degenerate into an irrotational vortex flow with tangential speed inversely proportional to the radius, which would destroy the stability of the interface and would lead to a re-mixing of the phases,

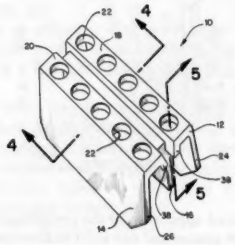
a device for controlling the two means for driving the centrifuge devices for stabilizing and regulating the ratio of their respective rotation speeds.

4,295,601

CENTRIFUGE TUBE HOLDER

Mark J. Cowell, Mountain View, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 13, 1979, Ser. No. 93,725
Int. Cl.³ B04B *15/00*
U.S. Cl. 233—26 **12 Claims**



1. A centrifuge tube holder comprising:

a first section for holding at least one centrifuge tube;

a second section for holding at least one centrifuge tube, each of said first and second sections having a support leg;

a central support post; and

means for pivotally connecting said first and second sections to allow respective movement between said first and second sections, the bottom edges of said central post, said first section support leg and said second section support leg being positionable in the same general horizontal plane, so that said support legs of said first and second sections with said central support post will support said tubes vertically on a workbench, said bottom edges of said centra. post, said first section support leg and said second section support leg being positionable in general alignment with a concave cylindrical surface so that said support legs and said central post will hold said tubes horizontally in a rotor with said tubes having different radial orientations with respect to the spin axis of said rotor.

4,295,602

CONTROL VALVE

Charles H. Priesmeyer, Park Ridge, Ill., assignor to Mark Controls Corporation, Evanston, Ill.

Filed Nov. 13, 1979, Ser. No. 93,063
Int. Cl.³ G05D *23/10*
U.S. Cl. 236—93 B **16 Claims**

13. In a shower of the type including an inlet pipe carrying water and a shower head secured to and communicating with said pipe, the improvement comprising:

a valve for restricting the flow of water with said shower head said valve comprising:

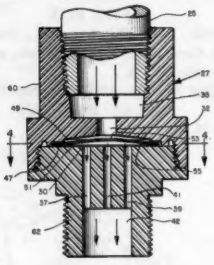
a housing;

a chamber in said housing;

an inlet port communicating with said chamber;

at least one outlet port communicating with said chamber; and

a bimetallic concave-convex circular plate having an aperture therethrough and having a surface, said plate subdividing said chamber into an inlet section containing said inlet port and an outlet section containing said outlet port, said inlet section and said outlet section communicating



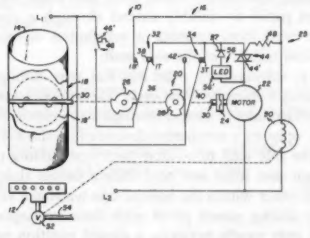
substantially only through said aperture, said aperture being offset with respect to at least one outlet port, said plate deflecting when its temperature substantially reaches a first predetermined value to a restricting position in which the surface thereof restricts the flow of water into said outlet port and deflecting into open position when its temperature substantially reaches a second predetermined value to permit the flow of said water into said outlet port.

4,295,603

MEANS CONTROLLING A FLUE DAMPER

Michael T. Clouser, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Nov. 13, 1979, Ser. No. 93,785
Int. Cl.³ G05D *23/00*
U.S. Cl. 236—1 G **13 Claims**

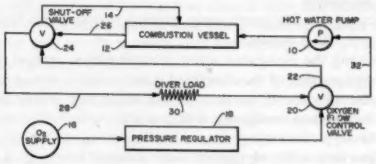


1. In a heating system wherein a flue damper regulates gas flow through a conduit from a heat source in accordance with temperature demand means actuating a heat source, an improved means controlling said flue damper comprising: a control means connected to said flue damper to rotate same to selectively open and close same at about 90° increments, including alternating current motor drive means; timing means driven by said motor drive means; and electrical circuit means including switch means responsive to said timing means and controlling electrical power in said control system and solid state switching means having a gate means connected to said heat source and selectively energizing and deenergizing said motor drive means wherein said gate means de-energizes said solid state switching means when said heat source is actuated.

4,295,604
AUTOMATIC TEMPERATURE CONTROL SYSTEM FOR DIVER HEATING SYSTEM

Sergius S. Sergev, Ventura, and Theodore J. Roster, Oxnard, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1980, Ser. No. 143,079
Int. Cl.³ F23N 5/06
U.S. Cl. 236—21 R **7 Claims**



1. A thermally controlled gas flow valve in which the gas flow through said valve is a function of the temperature of a first fluid comprising:

seat means having an orifice therethrough, a gas being fed under pressure into one end of said orifice;

means for transferring heat between the first fluid and a second fluid having a high coefficient of thermal expansion, including:

a reservoir filled with said second fluid; and

a plurality of tubes disposed within said reservoir, said plurality of tubes being coupled to receive said first fluid so that said first fluid passes through said tubes, said first and second fluid being in thermal contact with each other through said tubes so that heat may be transferred between said fluids;

means for varying the cross-sectional area of said orifice through which gas may flow as a function of the volume of the second fluid, including

expansion bellows means communicating with said reservoir to receive said second fluid so that an increase or decrease in the volume of said second fluid produces an expansion or contraction, respectively, of said bellows means along its longitudinal axis; and

a needle coupled to said bellows means so that expansion and contraction of said bellows means moves said needle into and out of said orifice to vary the cross-sectional area of the passage therethrough, thereby varying the gas flow through said orifice;

a carrier member having an elongated cavity, said bellows means being fixed to said carrier member with the expandable portion of said bellows means being disposed in said cavity, said cavity communicating with said orifice so that the gas passing through said orifice may flow to surround said bellows means within said cavity; and

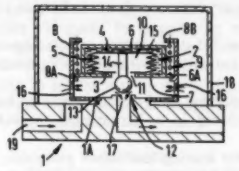
a valve body having an elongated chamber in which said carrier is disposed, said chamber having inlet means and outlet means so that the first fluid may be circulated through said chamber, the first fluid surrounding said carrier within said chamber.

4,295,605
STEAM TRAPS

Edward R. C. Clayton, Martock, and Alan F. Bennett, Cheltenham, both of England, assignors to Spirax Sarco Limited, Gloucestershire, England

Filed Jan. 22, 1980, Ser. No. 114,408
Claims priority, application United Kingdom, Jan. 26, 1979, 02777/79
Int. Cl.³ F16T 1/10
U.S. Cl. 236—56 **6 Claims**

1. A thermostatic steam trap comprising a base; a cover mounted on the base, the base and cover defining a hollow interior of the trap; a casing within said interior fast with the base and cover; a housing movably mounted in the casing; resilient means urging the housing to seat in the casing; a balanced pressure thermostatic element mounted in the housing; a valve member carried by the thermostatic element; an inlet port to said interior; an outlet port from said interior; and a valve seat in the outlet port; the casing locating the housing and the thermostatic element with respect to the outlet port so that the valve member carried by the thermostatic element co-operates with the valve seat in the outlet port for opening and closing the trap; the element defining an internal void that is open to steam/condensate within the trap and that is sealed from the interior of the housing in which the element is

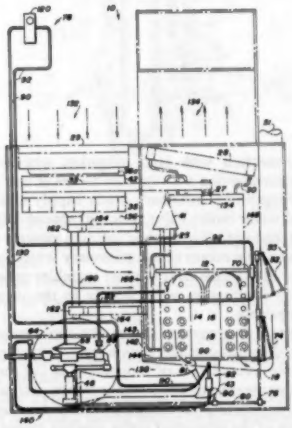


mounted; the housing having its interior sealed from said interior of the trap and containing volatile fluid which entirely fills the housing outside the element when the trap is fully open thereby to support the element; the element being moved by the pressure exerted by the volatile fluid upon heating of the fluid to urge the valve member carried by the element on to the valve seat to close the trap with the element, in the trap fully-closed condition, being in a nearly nesting condition; the housing moving away from its seating condition in the casing, against the action of said resilient means; to permit the element to adopt a fully nesting condition if further heating of the volatile fluid occurs.

4,295,606
HEATING SYSTEM

Paul F. Swenson, 25525 Edgecliffe, Euclid, Ohio 44132

Filed Aug. 14, 1978, Ser. No. 933,500
Int. Cl.³ F24D 5/00
U.S. Cl. 237—12.1 **12 Claims**



1. A self-contained, self-starting, heat powered air heating system for residential use comprising:

a vapor generator for converting a liquid to a vapor;

a rotary vapor turbine mounted in a container and connected for receiving all of the vapor coming from said vapor

generator and producing work during the expansion of the vapor passing therethrough;

a heat exchanger mounted at an elevation above said vapor generator for receiving all of the vapor exhausting from said turbine and operating at subatmospheric pressure for condensing said vapor;

feed pump means directly driven by said turbine and mounted at an elevation below the heat exchanger and between the heat exchanger and the vapor generator in a fluid flow relationship and connected to return said condensed vapor from said heat exchanger to said vapor generator;

fa means located exteriorly of said turbine container for conducting air over said heat exchanger to extract heat therefrom;

hermetically sealed drive means connecting said turbine to drive said fan means without shaft penetration of said container;

said vapor generator, said turbine, and said heat exchanger being connected in a hermetically sealed closed-loop cycle;

a gas burner for heating said vapor generator; and,

control means for controlling the flow of fuel to said burner including a thermostat responsive to the demand for heat at the point of use.

4,295,607

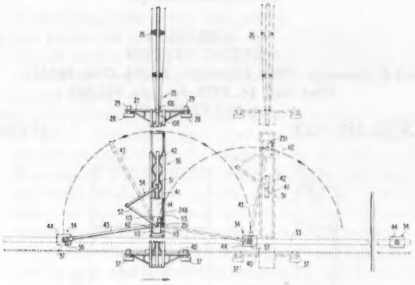
LAND IRRIGATING SYSTEM AND METHOD

Allen T. Noble, P.O. Box 1201, Boise, Id. 82701

Continuation-in-part of Ser. No. 923,291, Jul. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 887,792, Mar. 17, 1978, abandoned. This application Jun. 15, 1979, Ser. No. 48,886

Int. Cl.³ A01G *25/09*

U.S. Cl. 239—1 **14 Claims**



1. In connection with land irrigation wherein a moving sprinkler means having a water inlet means at one point moves along the length of a stationary water supply means having a plurality of water outlet valve means at spaced intervals along the length thereof, the method of successively connecting water outlet valve means of the stationary water supply means with water inlet means of the water sprinkler means to obtain substantially continuous water supply to the water sprinkler means comprising

providing a conveyance means for movement along the length dimension of the stationary water supply means at the same overall rate of movement as the moving water sprinkler means, the conveyance means carrying a support means supporting an elongated water conduit means for rotation of the elongated water conduit means around one end portion of the elongated water conduit means, the elongated water conduit means including water flow control valve means for closing the elongated water conduit means to water flow and having connecting means at the other end portion of the elongated water conduit means for rotatable water flow connection of the elongated water conduit means with any water outlet valve means, the elongated water conduit means being rigid from one end portion to the other end portion and having water outlet means connecting said one end portion of the elongated water conduit means for continuous water flow from the elongated water conduit means to the water inlet means of the water sprinkler means during water flow connection of the other end portion of the elongated water conduit means with a water outlet means, the steps including

closing the elongated water conduit means water flow control valve means,

rotating the elongated water conduit means around the one end portion of the elongated water conduit means to bring the other end portion of the elongated water conduit means into contiguity with a water outlet valve means,

rotatably connecting the connecting means at the other end portion of the elongated water conduit means to the contiguous water outlet valve means for water flow through the elongated conduit means to the sprinkler means,

opening the elongated water conduit means water flow control valve means,

subsequently rotating the so-connected elongated conduit means around the connected water outlet valve means while moving the conveyance means along the length dimension of the stationary water supply means, and

accommodating the rigidity of the elongated water conduit means during movement of the conveyance means by supporting the support means for movement toward and away from the stationary water supply means on a movable support means carried by the conveyance means, the movement being between a position of the support means closest to the water supply means when the conveyance means is far from any one of the water outlet valve means and a position of the support means farthest from the water supply means when the conveyance means is close to any one of the plurality of water outlet valve means.

4,295,608

SNOWMAKING NOZZLE

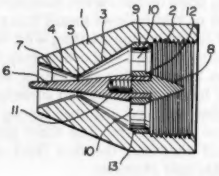
Jeffrey A. White, 1 Westmorland Rd., London, Ontario,, Canada (N6J 3N2)

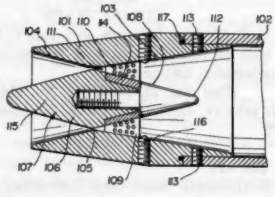
Filed Feb. 1, 1980, Ser. No. 117,468

Claims priority, application Canada, Nov. 8, 1979, 339450

Int. Cl.³ F25C *3/04*; B05B *7/10*

U.S. Cl. 239—14 **6 Claims**





1. A snowmaking nozzle for use in the production of artificial snow and adapted to be connected to a pressurized supply

of air and water for the concurrent flow of air and water therethrough, said snowmaking nozzle comprising

a nozzle housing (**1, 101**) having a nozzle axis;

an elongate tubular passageway in said nozzle housing coaxial with said nozzle axis and which, relative to the flow direction of air and water therethrough, has an upstream conically convergent section (**3, 103**), a central throat section (**5, 105**) and a downstream conically divergent section (**4, 104**);

an elongate restrictor (**6, 106**) which is a body of revolution positioned in said passageway coaxial with said nozzle axis and which along said nozzle axis is radially spaced apart from said nozzle housing, and having a conically convergent portion (**7, 107**);

said elongate restrictor being positioned in said passageway, relative to said flow direction, with the conically convergent portion (**7, 107**) located in said downstream conically divergent section of said passageway, and, a portion of said elongate restrictor also being positioned in said upstream conically convergent section of the passageway, said elongate restrictor being positioned in the passageway such that the widest part of the conically convergent portion is positioned no further downstream than the narrowest part of the cental throat section; and

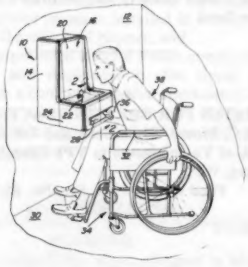
attachment means (**9, 109**) between said nozzle housing and said elongate restrictor (**6, 106**) for fixedly positioning said elongate restrictor in said passageway.

4,295,609

WALL MOUNTED DRINKING FOUNTAIN WITH PUSH BAR ACTUATOR

Frank Brown, Jr., Wilmington, Del., assignor to Sunroc Corporation, Glen Riddle, Pa.

Filed Nov. 6, 1978, Ser. No. 958,146
Int. Cl.[3] **E03B** *9/20*
U.S. Cl. 239—29 **2 Claims**



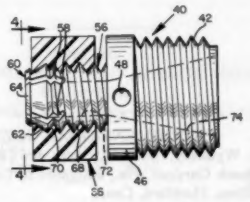
2. A control for a drinking fountain having a generally horizontally disposed basin with a waste water drain and a bubbler for discharging water in a vertical arcuate path, said control comprising a horizontally elongated push bar, means supporting said push bar enabling inward movement by a small force applied thereto at any point along the length thereof and in a position below the level of the basin and bubbler at a height generally equal to the heights of the arms of a wheelchair whereby the push bar is readily accessible to a handicapped occupant of a wheelchair when the wheelchair is rolled to a position adjacent the drinking fountain, and means associated with the push bar and bubbler to control flow of water from the bubbler, said basin being disposed atop a wall mounted cabinet structure terminating above the floor surface a distance to enable a wheelchair to move partially under the cabinet with the arms of the wheelchair adjacent the lower edge thereof, said push bar being movably disposed in a slot-like opening adjacent the bottom of the cabinet in a position adjacent the hands of a handicapped occupant of a whe.'chair whose arms are positioned on the arms of a wheelchair to enable the wheelchair occupant to control water flow, said control including a valve controlling flow of water to the bubbler, said valve including a generally horizontally disposed actuator rod oriented generally perpendicular to the push bar and inwardly thereof and above the plane of the push bar, said means supporting the push bar including a pivot plate, means supporting the pivot plate for swinging movement about a horizontal axis parallel to the push bar, generally perpendicular to the actuator rod and located above the actuator rod, said pivot plate including means engaging the actuator rod for operating the valve upon inward movement of the push bar, said means supporting said push bar including light force spring means connected with the pivot plate to return the pivot plate and push bar to a position to stop flow of water to the bubbler, said pivot plate being generally vertically disposed and horizontally elongated for supporting engagement with the push bar over a substantial portion of the length thereof with the pivot plate stabilizing the push bar to retain it in parallel relation to its "at rest" position regardless of where forces are exerted on the push bar along its length.

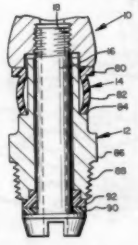
4,295,610

IRRIGATION SPRINKLERS

Lloyd W. Clements, 49 W. Lincoln Ave., Woodland, Calif. 95695

Continuation-in-part of Ser. No. 786,987, Apr. 13, 1977, abandoned. This application Oct. 24, 1978, Ser. No. 954,222
Int. Cl.[3] **B05B** *3/02*
U.S. Cl. 239—230 **6 Claims**





1. In a swiveled irrigation sprinkler,

a vertical bearing housing having an upwardly facing annular shoulder,

a swivel tube rotatable in the bearing housing,

seal means at the lower end of the housing between the swivel tube and the housing,

a sprinkler body secured to the upper end of the swivel tube and having an annular shoulder facing the first-mentioned annular shoulder,

a thin walled cylindrical tube loosely surrounding the housing and forming a spring sleeve of low friction material,

an upper wedge ring having a tapered portion extending into the upper end portion of the sleeve and engaging the annular shoulder of the body,

and a lower wedge ring engaging the shoulder of the housing and having a tapered portion extending into the lower end portion of the sleeve.

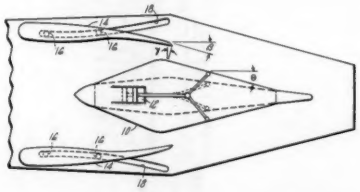
3. In an improved sprinkler nozzle structure,
a tubular nozzle having a discharge portion having segments defining a generally cylindrical orifice at its discharge end,
and adjustment means for pressing the segments inwardly to conical form to constrict the orifice,
the segments being spaced circumferentially from each other to define wedge-shaped auxiliary orifice slots and having cam surfaces,
the adjustment means comprising a nut screwed onto the nozzle and having a ring-like actuator portion engaging the cam surfaces,
the nozzle comprising a tube having the discharge end portion thereof longitudinally slotted to define the segments and having an externally threaded portion to receive the nut,
the slots extending from a point within the nut outward beyond the nut,
the nozzle having an unslotted cylindrical entrance portion of a predetermined internal diameter,
the discharge portion being of a substantially lesser internal diameter than said predetermined diameter,
the nozzle having a tapered transition portion connecting the entrance portion and the discharge portion,
the nut covering the major portion of the length of the segments.

4,295,611

TWO-DIMENSIONAL NOZZLE

Thomas A. Wynosky, Madison, Conn., and Charles A. Campbell, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 11, 1978, Ser. No. 968,598
Int. Cl.³ F02K 1/10
U.S. Cl. 239—265.37 **3 Claims**



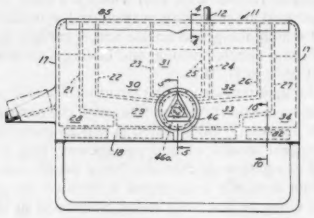
1. A two-dimensional exhaust nozzle construction for aircraft powered by a turbine type power plant receiving the fluid working medium exhausting in the ambient, a collapsible plug centrally mounted in said two-dimensional nozzle, at least one flap adjacent said nozzle and in spaced relationship defining a wall of said two-dimensional nozzle, said flap being a rigid member and said flap and said plug defining a passageway for conducting the fluid in said two-dimensional nozzle exhausting to ambient, said flap and said plug defining a throat angle and (throat are in the passageway, said flap movable in concomitant radial and axial directions to define a first geometry for optimizing the exhaust stream in a subsonic condition by making the throat angle substantially perpendicular at the exit of said flap relative to the plug surface and a second geometry for optimizing the exhaust stream in a supersonic condition by moving the throat within the flap and having its angle greater than the perpendicular relative to the plug surface, and means for scheduling the throat angle and throat area independent of each other.

4,295,612

SHOWER APPARATUS

James D. Betsinger, 19585 Rolling Acres Dr., South Bend, Ind. 46614, and James P. Bailey, 552 Apache Dr., Batavia, Ill. 60510

Filed Oct. 17, 1979, Ser. No. 85,722
Int. Cl.³ B05B 7/32
U.S. Cl. 239—310 **24 Claims**



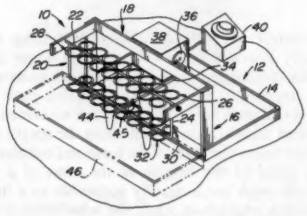
1. A shower apparatus comprising
a shower head which is to be adapted to be connected to a source of water,
means in said head operable by the flow of water to produce a vacuum,
a housing having a plurality of reservoirs for containing diverse liquids,
a line extending from said vacuum producing means to said housing,
first valve means in said housing for selectively connecting one of said reservoirs to said line,
second valve means in said housing operable to isolate a portion of the liquid from the selected reservoir and thereafter provide communication to said line so that said predetermined quantity may be drawn by suction to said shower head.

4,295,613

APPARATUS FOR BREAKING BACTERIAL CELLS

W. Edward C. Moore, Blacksburg, and James A. Blanks, Norfolk, both of Va., assignors to VPI Educational Foundation, Blacksburg, Va.

Filed Oct. 3, 1979, Ser. No. 81,415
Int. Cl.³ B02C 17/14
U.S. Cl. 241—2 **9 Claims**



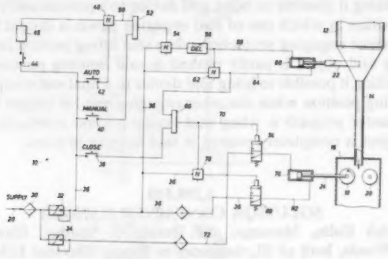
1. A method of breaking bacterial cells within upright tubes having a tapered closed end comprising harvesting a culture containing bacterial cells in tubes, placing beads in the tubes containing bacterial cells to be broken, oscillating the tubes about a horizontal axis adjacent their upper ends at a rate of approximately 1725 to 1800 cycles per minute, and preventing destruction of proteins and enzymes released during cell breakage by immersing the closed ends of the tubes in a bath of cool liquid during said oscillating step.

4,295,614

PNEUMATICALLY OPERATED GRAIN HANDLING APPARATUS

Ned J. Bond, III, P.O. Box 40246, Houston, Tex. 77040

Filed Oct. 15, 1979, Ser. No. 84,831
Int. Cl.³ B02C *25/00*
U.S. Cl. 241—34 **9 Claims**



1. An apparatus for controlling the delivery of grain which comprises:

(a) a grain hopper having a restricted grain flow outlet;

(b) movable gate means operatively positioned relative to said grain hopper for selectively controlling the flow of grain from the grain flow outlet thereof, said gate having open and closed positions;

(c) grain processing equipment connected to receive grain from said grain flow outlet and which is operated by axial movement of a piston rod where extension thereof operates the equipment and retraction thereof modifies the operation of the grain processing equipment;

(d) grain flow sensor means adapted to be installed in a path of flow for the grain through said hopper and which sensor means forms a pneumatic binary output indicative of the presence or absence of grain flow and further wherein said sensor means is installed in the flow path of grain flowing through said hopper; and

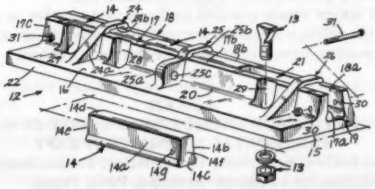
(e) pneumatically powered control means connected to said sensor means and responsive to the signal provided thereby to form a control signal for operation of said gate means, said gate means being opened in the presence of grain flow and being closed in the absence of grain flow by said control means.

4,295,615

SHELL LINER ASSEMBLY FOR ORE COMMINUTING MACHINE

James E. Mishek, Arden Hills, Minn., assignor to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.

Filed Sep. 27, 1979, Ser. No. 79,385
Int. Cl.³ B02C *17/22*
U.S. Cl. 241—182 **24 Claims**



1. A liner assembly for the shell of an ore grinding machine having a predetermined axis of rotation, the liner assembly comprising:

a plurality of longitudinal holder segments having first and second ends and each defining a mounting surface constructed for mounting engagement with the inner surface of said shell, and a grinding surface;

each holder segment further defining a longitudinal channel extending from one end to the other, said longitudinal channel having a closed bottom and opening at the grinding surface, and being further defined by longitudinal sides that converge at least in part toward the grinding surface;

and a plurality of longitudinal wear inserts for the holder segments, each insert sized for lengthwise insertion into one of said longitudinal channels and being one piece with a cross section that substantially fills the channel, and each insert further comprises longitudinal sides that converge at least in part in conformance with the channel sides so that the insert is retained within the channel;

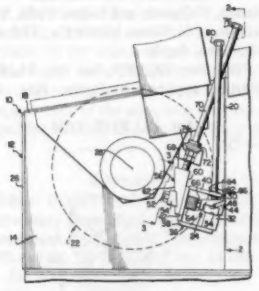
and means for securing the holder segments to the shell of the ore grinding machine, the holder segments being arranged in the assembly with the longitudinal channels and wear inserts extending axially of the shell.

4,295,616

CHOPPING MECHANISM WITH REMOTE SHEARBAR ADJUSTER

Amos G. Hill, Hesston, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Oct. 4, 1979, Ser. No. 81,839
Int. Cl.³ B02C *18/16*
U.S. Cl. 241—241 **8 Claims**



1. In combination with a rotary chopper and a cooperating shearbar assembly that includes a shearbar and a shoulder movable with said shearbar during adjustment of the latter, an adjuster for controlling the position of said shearbar with respect to said chopper comprising:

a support mounting said shearbar for shifting thereof along a first path of travel extending toward and away from the chopper;

a stationary shoulder disposed in spaced opposition to said movable shoulder and held against said shifting with the shearbar; and

a cam wedge operably drivable between said shoulders in engagement therewith along a second, rectilinear path of travel in a direction to effect said shifting of the shearbar,

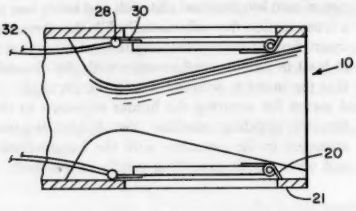
said assembly including means for maintaining said movable shoulder engaged with said wedge.

4,295,617

SELECTABLE DRAG BRAKES FOR ROCKET RANGE CONTROL

Herman R. Oswell, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 2, 1979, Ser. No. 81,302
Int. Cl.³ F42B *13/32*
U.S. Cl. 244—3.29 **3 Claims**



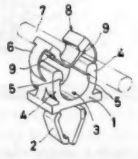
1. Apparatus for controlling the range of a free-flight artillery rocket comprising:
(a) a plurality of drag brakes disposed around the periphery of the motor of said rocket;
(b) means for retaining said drag brakes in unextended position said means including a pin for engagement with each of said drag brakes for secured relation thereof;
(c) actuating means for selectively releasing predetermined pairs of said drag brakes; and,
(d) means for releasing said drag brakes to an extended position responsive to energization of said actuating means said means for releasing said drag brakes to said extended position being a spring secured to one end of each said drag brake and said rocket.

4,295,618

DEVICE FOR FIXING PIPES, RODS AND OTHER ELONGATED BODIES

Kazutoshi Morota, Fujisawa, and Takuo Yuda, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd. and Nifco, Inc., both of Yokohama, Japan

Filed Nov. 13, 1979, Ser. No. 93,389
Claims priority, application Japan, Nov. 15, 1978, 53-156074[U]
Int. Cl.³ F16L *3/08*
U.S. Cl. 248—73 **3 Claims**



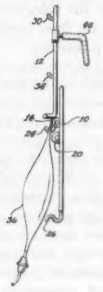
1. In a device for fixing a tube, rod or other elongated object comprising a base plate, an anchor provided on the bottom surface of said base plate, at least two vertical walls provided on the top surface of said base plate and standing thereon parallel to each other to define at least one upward diverging "U"-shaped housing portion, a pair of opposite engaging projections provided on the upper parts of the inner surfaces of each pair of adjacent vertical walls defining each said housing portion, a foldable fitting portion which is adapted to embrace the object to be fixed, a flexible supporting portion extending from one of said two adjacent vertical walls and connected to said foldable fitting portion for thereby supporting said foldable fitting portion above said housing portion, and a pair of engaging pawls provided on the outer sides of the opposite ends of said fitting portion, thus permitting said device to positively hold said object through engagement of said engaging pawls with said engaging projections when said fitting portion embracing said object is pushed into said housing portion, the improved device having the members of at least one pair selected from said pair of engaging projections and said pair of engaging pawls provided at different levels thereby making it possible to bring said device to a provisionally fixing position in which one of said engaging pawls is caught by the counter engaging projection when said fitting portion embracing said object is partly pushed in said housing portion, and making it possible to bring said device to a final and completely fixing position when the other engaging pawl is caught by the counter projection when said fitting portion embracing said object is completely pushed in said housing portion.

4,295,619

SOLUTION CONTAINER HANGER

Ralph Kulin, Marengo, and Ronald C. Stauber, Hawthorn Woods, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 13, 1979, Ser. No. 93,356
Int. Cl.³ B65B *67/12*
U.S. Cl. 248—95 **6 Claims**



1. A solution container hanger comprising:
(a) a first member;
(b) a second member rotationally affixed to the first member to enable the solution container hanger to be placed in an infusion, drain, or storage position;
(c) support means attached to the first member to suspend and support a solution container in an infusion position in which the first and second members are substantially parallel;
(d) support means attached to the second member to suspend and support a solution container in a drain or infusion position in which the first and second members are substantially perpendicular in a drain position and substantially parallel in an infusion position; and
(e) hanger means attached to the second member to enable the solution container hanger to be hung in an infusion position from a door or other elevated structure.

4,295,620

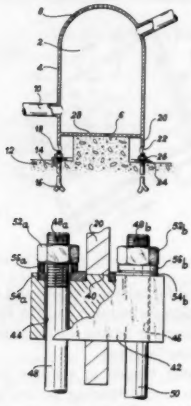
DEVICE FOR ANCHORING A VESSEL IN A HORIZONTAL FOUNDATION RAFT

Andre LeClou, Saint Remy les Chevreuse, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 16, 1979, Ser. No. 12,730
Claims priority, application France, Feb. 17, 1978, 78 04577
Int. Cl.³ A47G *23/02*
U.S. Cl. 248—154 **3 Claims**

1. A device anchoring a cylindrical vessel having a vertical axis in a foundation raft, wherein said device comprises n

orifices formed at the lower end of a lateral wall of said vessel and uniformly spaced along its periphery and n mounting elements, each mounting element being constituted by a horizontal cross-pin extending through one of said orifices so that one end of said element is located inside said vessel and the



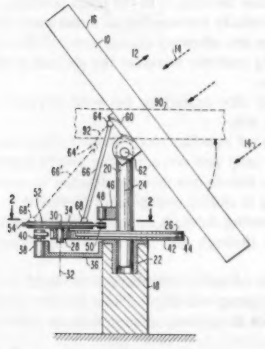
other end is located outside said vessel and by two identical assemblies for anchoring said vessel in said raft, each anchoring assembly being a rocker-arm system of two tie-bolts anchored in said foundation raft and by a cross-member in which one end of said horizontal cross-pin is rotatably mounted.

4,295,621

SOLAR TRACKING APPARATUS

Bohdan W. Siryj, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 18, 1980, Ser. No. 131,517
Int. Cl.³ F16M *11/12*; G02B *21/24*
U.S. Cl. 248—183 **1 Claim**



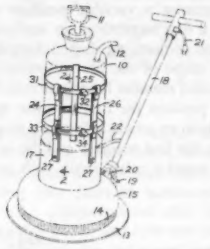
1. In a solar tracking apparatus the combination comprising:
a base;
a support member, rotatably secured to the base for rotation about a first vertical axis;
means for rotating said support member about said first vertical axis, said means including a first horizontal pulley secured to the support member, and pulley drive means secured to the base and pulley for rotating the pulley with respect to the base;
a pivot member rotatably secured to said support member for rotation about a horizontal axis;
elevation drive means for rotating said pivot member about said horizontal axis, said elevation drive means including a second horizontal pulley rotatably secured to the first pulley for rotation about a second vertical axis, and means secured to the support member for rotatably driving said second pulley about said second axis; and
a link member pivotally secured to said second pulley at a point spaced from the second vertical axis and to said pivot member at a point spaced from said horizontal axis.

4,295,622

FRAMEWORK HOLDER FOR ATTACHING CONTAINER TO FLOOR MACHINE

Barry L. Cutler, 7 Stanford Ct., East Windsor, N.J. 08520

Filed May 23, 1980, Ser. No. 152,617
Int. Cl.³ A47K *1/08*
U.S. Cl. 248—313 **4 Claims**



1. A holder of framework structure for removably attaching a fluid container to floor and carpet cleaning and polishing machines which comprises at least three parallel elongated upright standards spaced from each other around a circle, an adjustable, encircling strap at the lower ends of the standards for drawing the standards closer together to press them frictionally against a machine for detatchably securing them to such a machine, retaining means carried by the standards and forming recesses for receiving and holding said lower encircling strap in place on the standards, an adjustable top encircling strap at the upper ends of said standards to draw them into frictional engagement with a fluid container, and retaining means at said upper ends of the standards and forming recesses for receiving and for holding said top encircling strap in place.

4,295,623

VARIABLE POSITION ARTICLE HOLDER

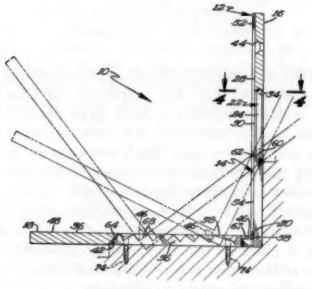
Eduard H. Schweizer, Dusseldorf, Fed. Rep. of Germany, assignor to Investment Rarities, Inc., Bloomington, Minn.

Filed Feb. 12, 1979, Ser. No. 11,280
Int. Cl.³ A47F *5/12*; A47G *1/24*
U.S. Cl. 248—456 **45 Claims**

1. A variable position tape holder for holding cassette, 8-track, or video tape boxes comprising, in combination: a first L-shaped member for holding at least one tape box and including first and second legs, a second L-shaped member including first and second legs, with the first L-shaped member including an L-shaped aperture of a shape and size corresponding to and for receiving the second L-shaped member such that the first leg of the first L-shaped member is U-shaped and includes a central portion and first and second leg portions and the second leg of the first L-shaped member is also U-shaped and includes a central portion and first and second leg portions, with the ends of the leg portions of the first and second legs of the first L-shaped member being joined together forming a corner, with the inside surfaces of the first and second leg portions of the first leg of the first L-shaped member including longitudinal slots, with the second leg of the second L-shaped member including a series of angular support positions comprising a washboard series of angular peaks, with the first

L-shaped member including means for engaging with the angular support positions comprising ratchet levers extending from the ends of the first and second leg portions of the second leg of the first L-shaped member into the aperture along the corner, thus giving the second leg of the first L-shaped member a C-shape, and means for slidably and pivotally mounting the first leg of the first L-shaped member to the first leg of the second L-shaped member comprising detents extending along the end of the first leg of the second L-shaped member which extend into the slots of the first L-shaped member for slidable and pivotal movement therein allowing the first L-shaped member to be slid and pivoted with respect to the second L-shaped member allowing the ratchet levers to engage with one of the angular support positions to thereby hold the first L-shaped member in any one of several angular positions.

38. In an article holder characterized by a member having at least one surface to support at least one article thereon, the improvement comprising a variable position article holder consisting only of: a first member of an unchanging shape; a second member of an unchanging shape substantially the same as the unchanging shape of the first member; with the first member and the second member having an interfitting relation such that in a first position the first member and the second member interfit to form an article holder of a single outline and in a second position the first member and the second member interfit to have an angular relationship with respect to each



other such that one of the first member and the second member forms a base and the other of the first member and the second member forms an article holder and holds articles at any of various angular relationships with respect to the base, and wherein the interfitting relationship between the first member and the second member includes a pivotal and slidable relation.

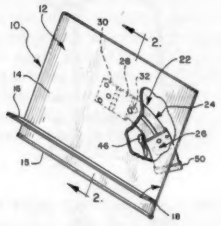
39. In an article holder characterized by a member having at least one surface to support at least one article thereon, the improvement comprising a variable position article holder consisting only of: a first member of an unchanging shape; a second member of an unchanging shape substantially the same as the unchanging shape of the first member; with the first member and the second member having an interfitting relation such that in a first position the first member and the second member interfit to form an article holder of a single outline and in a second position the first member and the second member interfit to have an angular relationship with respect to each other such that one of the first member and the second member forms a base and the other of the first member and the second member forms an article holder and holds articles at any of various angular relationships with respect to the base, wherein the interfitting relationship includes a plurality of angular support positions formed on the second member and means immovably attached on the first member for engaging with the angular support positions of the second member to thereby position the first member at any one of various angular relationships with respect to the second member.

4,295,624

READING STAND

Wilfredo A. Granada, 2600Elisha, Zion, Ill. 60099

Filed Sep. 22, 1980, Ser. No. 189,892
Int. Cl.[3] A47G *1/24*
U.S. Cl. 248—456 4 Claims



1. A collapsible stand for retaining books and similar materials in an inclined position for reading and the like comprising:

a plate-like planar member having a supporting surface and an opposed rearward surface;

a planar strip member hinged to a lower portion of said supporting surface and extending generally horizontally to form a ledge for retaining a book or similar material, said strip being hinged so that in the open position the ledge extends to form a surface generally perpendicular to the support surface and in the closed position folds against the support surface so that it abuts and is generally parallel thereto;

a first arcuate strip section hinged to the rearward surface of said support plate, said strip section being hinged so that in an open position, the arcuate strip extends generally perpendicular from the rearward surface, and in the closed position, the strip folds against the rearward surface so that it abuts and is generally parallel thereto;

a retaining member attached to said hinged end of said arcuate strip having a surface which abuts the rearward surface when the strip is in the open position;

a catch pivotally mounted on said rearward surface to move along an arc allowing engagement of the catch with said retaining member to retain the arcuate strip in said open position;

an arcuate slot extending between opposite ends in said arcuate strip;

a plurality of saw-like teeth formed along one edge of the arcuate strip and extending the length thereof;

an arcuate female member constructed to receive said arcuate strip in sliding engagement therewith;

a pin extending through opposite sides of said female member and through said slot for sliding engagement therewith;

a plurality of roller members positioned in spaced apart relation along one edge of said female member and positioned for sliding engagement with an edge of said arcuate strip;

a ratchet arm pivotally mounted to an opposite edge of said female member;

a spring biasing the ratchet arm so that one end is pivoted to engage the saw teeth on the edge of the arcuate strip; and

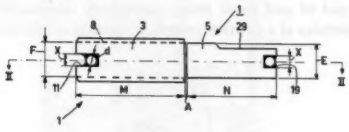
a resilient restraining member attached to the opposite end of said female member to form a foot, said arcuate strip and arcuate female member cooperating to form a telescoping leg which is adjusted by sliding said female member over said strip and adjusting their relative positions with said ratchet arm, said telescoping leg adjustably varying the angle of inclination of said support surface relative to a horizontal surface.

4,295,625

PRECISION ADJUSTING DEVICE

Wolter W. J. Degger, and Adrianus C. Van Kasteren, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 18, 1979, Ser. No. 58,413
Claims priority, application Netherlands, Jul. 31, 1978, 7808045
Int. Cl.³ A47F 7/14
U.S. Cl. 248—466 4 Claims



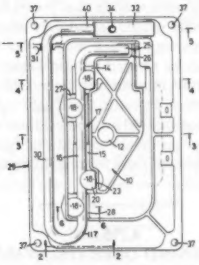
1. A precision adjusting device, comprising a screw body, a holder body and a connecting, elongated torsion member which can be deformed by rotation of the screw body, the torsion member being made of a plastically deformable material, the ends of said member being connected to the screw body on the one side and to the holder body on the other side, the part of the torsion member situated between the two ends being twistable.

4,295,626

RESILIENT MOUNTING FOR A RECLINING SEAT

Eddie A. J. Large, Bayton Rd, Exhall, Coventry, West Midlands, England (CV7 9DT)

Filed Mar. 30, 1979, Ser. No. 25,368
Int. Cl.³ A47B 1/02
U.S. Cl. 248—575 10 Claims



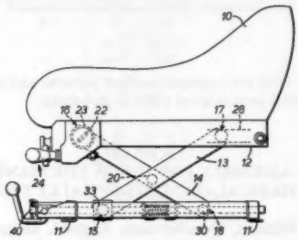
1. A resilient mounting for a reclining seat, said mounting comprising a first member to be secured to a supporting base for the seat, a second member to be secured to the seat and a torsion bar pivotally connecting the second member to the first member, said torsion bar forming a pivot for the two members and providing a return bias when one of the members is tilted relative to the other, said torsion bar having a first bent over free end section which reacts against the first member, a second bent over free end section which reacts against the second member and an elongate rectilinear portion intermediate said free end sections which forms the pivot for the two members, aligned cradles on said first and second members which locate a portion of said elongate rectilinear portion of said torsion bar which forms the pivot, and retainers on said first and second members for rotatably retaining said elongate portion of the torsion bar in said cradles.

4,295,627

SPRING SUSPENSIONS FOR VEHICLE SEATS

Kevin Graves, Cogenhoe, England, assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 15, 1979, Ser. No. 84,925
Claims priority, application United Kingdom, Oct. 19, 1978, 41225/78
Int. Cl.³ B60N 1/02; A47C 3/22
U.S. Cl. 248—588 5 Claims



1. A spring suspension for a vehicle seat, the suspension comprising a seat frame, a base frame, a scissor-action linkage arm system interconnecting said seat frame and base frame, the system including two pairs of scissor-action linkage arms spaced apart on a common pivot axis, pivotal connections interconnecting the ends of said arms and said frames to permit the frames to move towards and away from one another, each pivotal connection on one pair of arms being coaxial with a corresponding pivotal connection on the other pair of arms, and a biassing spring connected between parts of the suspension which pivot relatively to one another during relative movement of the frames towards or away from each other to bias the two frames away from one another, all of the pivotal connections between one of said seat and base frames and the adjacent ends of the linkage arms connected to said one frame being displaceable connections extending in a common direction to permit both relative pivotal movement between the linkage arms of each pair and relative translational movement between all the linkage arms and said one frame and a motion limiting resilient coupling, including an anchoring spring of limited expansion and contraction connected between said one frame and one of said displaceable connections to the linkage arm system to permit relatively free fore and aft translational movement along said common direction between the whole linkage arm system and said one frame within the limits of expansion and contraction of the spring thereby reducing the transmission of vibration in said common direction between the base frame and the seat frame.

4,295,628

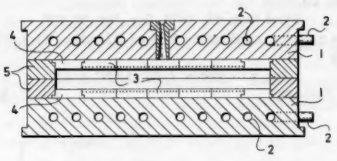
MOLD FOR THE INJECTION MOLDING OF OBJECTS OF LARGE DIMENSION AND COMPLICATED SURFACES FROM PLASTIC MATERIAL

Lubomir Kupf, Prague; Jiri Travnicek, Celakovice; Radomil Adamek, Pardubice, and Josef Kyzlink, Brno, all of Czechoslovakia, assignors to Statni vyzkumny ustav materialu, Prague, Czechoslovakia

Filed Nov. 9, 1979, Ser. No. 93,130
Int. Cl.² B29C 5/00
U.S. Cl. 249—80 13 Claims

1. A mold for forming injection moldings of large dimensions and complicated surfaces from plastic material, comprising a pair of opposed metal base plates, spaced circumferential strips defining a mold cavity, cooling grids composed of tubes embedded in said base plates, shaped forming plates and forming strips removably fixed by fixing means to the internal surface of the base plates forming a part of the active surface of the mold, said active surface of the forming plates and forming

strips, together with the surface of said fixing means which is flush with said forming plates, and the forming strips being



provided with the required surface pattern, and mobile cores for the mold provided on parts of the mold.

4,295,629

MOULD ASSEMBLY FOR USE IN THE MANUFACTURE OF SPHERICAL OR SUBSTANTIALLY SPHERICAL ARTICLES

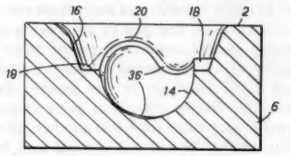
William Williams, Queniborough, England, assignor to Delta Mouldings (Leicester) Limited, Leicester, England

Filed Aug. 11, 1980, Ser. No. 176,791

Claims priority, application United Kingdom, Aug. 17, 1979, 28822/79

Int. Cl.³ B29C *1/00*

U.S. Cl. 249—160 **4 Claims**



1. A moulding assembly comprising two mould members having mutually confronting surfaces each surrounding a part-cavity, a generally spherical mould cavity being defined when confronting surfaces are in contact with one another, lip portions of said surface defining a continous parting line around a diametral zone of the cavity, said parting line having four portions, comprising two substantially S-shaped portions with two at least substantially straight-line portions, said portions being arranged alternately around the diametral cavity zone, each portion of the line meeting its adjacent portion to include an angle of not substantially less than a right-angle.

4,295,630

FAIL-SAFE ACTUATOR AND HYDRAULIC SYSTEM INCORPORATING THE SAME

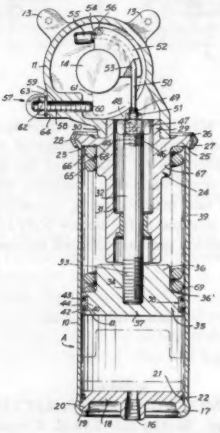
Lorin P. Card, Sepulveda, and Otto W. Borsting, Long Beach, both of Calif., assignors to Greer Hydraulics, Incorporated, Chatsworth, Calif.

Filed Aug. 9, 1979, Ser. No. 65,368

Int. Cl.³ F16K *31/143;* F15B *13/044*

U.S. Cl. 251—14 **2 Claims**

1. A fail-safe rotary actuator member for imparting rotary movement to the shaft of a rotary valve responsive to a failure condition and for enabling unimpeded conventional operation of said valve during normal operating conditions comprising, in combination, a casing having a cylindrical bore formed therein and having a port at one end thereof, a piston mounted for reciprocal movement within said bore between extended and contracted positions and defining with said bore a variable volume fluid pressure chamber, spring means in said casing biased between said piston and the other end of said casing for urging said piston to said extended position whereat said piston lies adjacent said port end of said chamber, pilot valve means connected with said port for selectively introducing and bleeding fluid from said chamber, thereby to control the position of said piston in said chamber, a housing on said casing, a drive shaft journalled in said housing and connected to said valve shaft for rotation between first and second positions about an axis of rotation perpendicular to the axis of said bore, a quadrant-shaped yoke member mounted on said drive shaft and including an outwardly open peripheral guide track coaxially arranged with respect to said drive shaft, a flexible cable having one end operatively connected to said piston, said cable being disposed in said guide track of said yoke member, the other end of said cable being operatively connected to said yoke member at a position to induce rotation of said drive shaft



from said first to said second position responsive to movement of said piston from said retracted to said extended position, said cable, when said drive shaft is in said second position, being in a slack condition when said piston is in said retracted position and in a tautened condition when said piston is in said extended position, drive handle means operatively associated with said drive shaft for imparting rotary movement thereto whereby said drive shaft may be rotated by said handle means between said positions without interference from said cable when said piston is in said retracted position, and said cable is effective to rotate said drive shaft to said second position when said piston is shifted by said spring means to said extended condition as a result of outward flow of fluid from said chamber through said port.

4,295,631

SOLENOID OPERATED VALVE

Walter E. Allen, 9 Barry La., Prospect, Conn. 06511

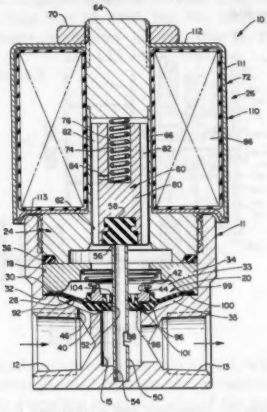
Filed Mar. 21, 1980, Ser. No. 131,950

Int. Cl.³ F16K *31/02*

U.S. Cl. 251—30 **13 Claims**

1. In a valve assembly having a primary valve and a solenoid operated pilot valve with respective linear primary and pilot valve members, each shiftable linearly between open and closed alternate operating positions thereof, the solenoid operated pilot valve being connected to the primary valve for operating the primary valve member to its said alternate operating positions upon operation of the pilot valve member to its said alternate operating positions respectively, the improvement wherein the primary valve member has an axial opening, and wherein the pilot valve comprises a fixed linear pilot valve tube mounted coaxially with and extending through the axial opening of the primary valve member and has an inner fluid passageway through the primary valve member to provide fluid communication between opposite axial sides of the pri-

mary valve member, the primary valve member having fluid sealing means around its said axial opening which remains in sealing engagement with the fixed linear pilot valve tube as the primary valve member shifts linearly between its open and closed operating positions, and the pilot valve member in its



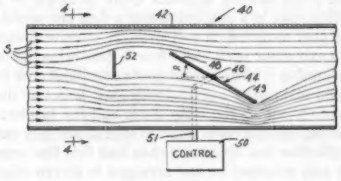
alternate operating positions being operable for selectively opening and closing the said inner fluid passageway of the pilot valve tube for selectively connecting the opposite axial sides of the primary valve member through the primary valve member for controlling the pressure drop across the primary valve member.

4,295,632

METHOD AND APPARATUS FOR REDUCING TORQUE ON AN AIR DAMPER

Roger P. Engelke, Roscoe, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Sep. 28, 1978, Ser. No. 946,478
Int. Cl.³ F16K *1/22, 47/08*
U.S. Cl. 251—127 **8 Claims**



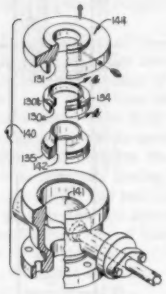
1. A volume air flow controller comprising a duct, a butterfly damper mounted in the duct, said damper movable about a pivot and having leading and trailing portions, and control means adapted to position said damper to control air flow through the duct, and a fixed air flow impedance located in said duct upstream from said damper and extending across said duct generally in the direction of the damper axis, said air flow impedance medially positioned within said duct offset to the leading portion-side of the axis of said damper and displaced from substantially opposite duct wall portions so as to permit portions of the air flow to pass between said opposite duct wall portions and respective sides of said air flow impedance in the directions of said leading and trailing portions respectively, said impedance changing the air velocity profile within the duct so that the velocity of air acting upon at least a portion of the leading portion of said damper is reduced whereby the damper-closing torque resulting from the aerodynamic forces produced by air flow past said damper is reduced.

4,295,633

EXPANSIBLE DEVICE

James W. Sigmon, 2415 Knollwood Rd., Charlotte, N.C. 28211

Filed Jan. 26, 1979, Ser. No. 6,892
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—172 **24 Claims**



1. A force transmitting device capable of sealing against fluid flow while accommodating a limited range of movement and comprising an annular thin wall member having stepped diameter cylindrical portions joined by a force transmitting surface portion which portions cooperate to impart a generally "S" shaped cross-section to said thin wall member, restraining means engaging said thin wall member for supporting inner and outer axial and circumferential terminal end portions thereof agsinst movement, a movable member having a surface contoured to engage one side of said thin wall member for supporting said portions thereof against tensile stress, and means for exerting force against the other side of said thin wall member for transmission therethrough to said movable member, said thin wall and movable members cooperating for accommodating movement by displacement of the material of said thin wall member from one to another of the portions thereof.

4,295,634

STRUT COMPRESSOR

Phillip A. Spainhour, Waukegan; Leonard A. Morrison, Chicago, and Robert S. Hampton, Jr., Wadsworth, all of Ill., assignors to Ammco Tools, Inc., North Chicago, Ill.

Filed Jun. 30, 1980, Ser. No. 164,801
Int. Cl.³ B23P *19/04*
U.S. Cl. 254—10.5 **5 Claims**

1. Apparatus for use in assembling and disassembling a strut assembly of the type having a shock absorber axially disposed within a coil spring, comprising in combination

a plurality of upright support rails,

a first platen fixedly mounted to said support rails,

a second platen slidably disposed on said support rails,

a plurality of stand-off members depending from said second platen toward said first platen for engagement with said strut,

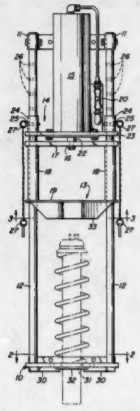
an opening centrally disposed with respect to said stand-off members through which a tool may be inserted for disassembly of said strut,

said first and second platens including means for holding said coil spring in a compressed condition therebetween,

a third platen slidably disposed on said support rails,

a fluid operated piston-cylinder assembly mounted between said second and third platens for moving said platens apart, and

means for fixedly connecting said second and third platens to said support rails at adjustable positions thereon to restrain



said second and third platens against movement relative to said first platen.

4,295,635

UNIVERSAL PNEUMATIC BELLOWS JACK LIFTER

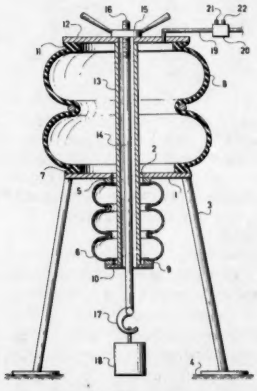
Zdenek Pustka, and Oldrich Krejcir, both of Liberec, Czechoslovakia, assignors to Vysoka skola strojni a textilni, Liberec, Czechoslovakia

Filed Aug. 28, 1980, Ser. No. 182,302

Claims priority, application Czechoslovakia, Aug. 30, 1979, 5907-79

Int. Cl.³ B66F *3/24*

U.S. Cl. 254—93 HP **5 Claims**



1. Universal pneumatic bellows jack lifter comprising two coaxial elastic bellows of different diameter, one end of each of said bellows being provided with a common closing cover adapted to be fixed to a suitable base, said common closing cover having a central opening, the remaining ends of both bellows being closed by further covers mutually connected by a bar, said bar being provided with at least one termination for the manipulation of a load and means for selectively introducing fluid under pressure into both of the bellows and exhausting it therefrom.

4,295,636

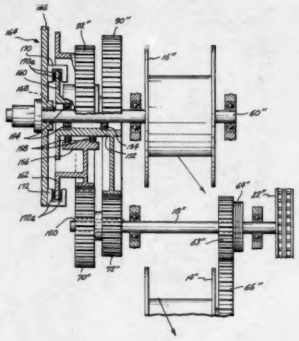
SYSTEM FOR INHAULING AND OUTHAULING LINES

Frederic E. Langford, Redmond, Wash., assignor to Washington Logging Equipment, Inc., Auburn, Wash.

Filed Nov. 16, 1978, Ser. No. 961,224

Int. Cl.³ B66D *1/26*

U.S. Cl. 254—304 **2 Claims**



1. In a system for inhauling and outhauling lines including

a drive shaft, a prime mover operably coupled to rotatively drive said drive shaft, and a reversible transmission means operably interposed between said prime mover and said drive shaft for selectively reversing the rotational direction of said drive shaft,

a haulback drum mounted in a haulback shaft and a line wrapped on said haulback drum, and

a main drum mounted on a main shaft and a line wrapped on said main drum, the improvement comprising:

a first gear mounted on and arranged in driven relationship with said drive shaft and a second gear arranged in driven relationship with said first gear mounted on one of said main shaft and said haulback shaft, and clutch means operatively associated with said first and second gears for selectively coupling said drive shaft to said one shaft in driving relationship to rotate the corresponding one of the main drum and the haulback drum mounted on said one shaft to take in a pay out line at a first line speed,

a third gear mounted on and arranged in driven relationship with said drive shaft and a fourth gear arranged in driven relationship with said third gear and mounted on the other of said main shaft and haulback shaft to rotate the corresponding one of the main drum and the haulback drum mounted on said other shaft to take in and pay out line at an effective line speed less than said first line speed,

a fifth gear mounted on and arranged in driven relationship with said drive shaft and a sixth gear arranged in driven relationship with said fifth gear and mounted on the other of said main shaft and said haulback shaft, to rotate the corresponding one of said main drum and said haulback drum mounted on said other shaft to take in and pay out line at an effective line speed greater than said first line speed, said third and fifth gears forming a first gear set and said fourth and sixth gears forming a second gear set, one of said first and second gear sets being affixed to the shaft on which they are mounted, the other of said first and second gear sets being mounted for rotation relative to the shaft on which they are mounted, and

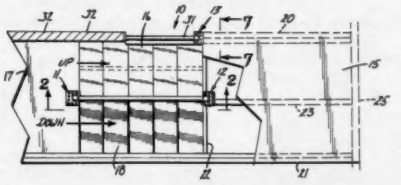
an energy-absorbing clutch means affixed to the shaft on which said other of said first and second gear sets is mounted for selectively and alternately coupling one of the gears of said other set in driving relationship to the shaft on which it is mounted and for selectively allowing restrained, relative movement between said one of the gears of said other set and the shaft on which it is mounted so that the line speed to and from the haulback drum can

be substantially equalized with the line speed respectively from and to the main drum.

4,295,637
GUARD RAIL
Anton Hulek, Goglerfeldgasse 15, A-4020 Linz, Austria
Filed May 15, 1980, Ser. No. 150,075
Claims priority, application Austria, May 23, 1979, 3775/79
Int. Cl.³ A01K *3/00*
U.S. Cl. 256—13.1 **5 Claims**

1. In a guard rail for use alongside a road, which comprises a sheet material profiled to form two substantially U-shaped side portions extending longitudinally of the guard rail and a web interconnecting the side portions, the two side portions and the web defining a substantially U-shaped recess therebetween and the side portions projecting substantially perpendicularly from a plane defined by the web, the U-shaped side portions having the base of the U radially spaced from and substantially parallel to said plane, the improvement of the web being a grid.

4,295,638
NEWAL POST ASSEMBLY
Gene H. Eldeen, 521 Oak St., Farmington, Minn. 55024
Filed Feb. 22, 1980, Ser. No. 123,841
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—59 **9 Claims**



1. A newal post assembly for installation with respect to a floor type surface comprising:

an elongate wooden newal post for intended use in a generally upright orientation and having a transverse bottom surface;

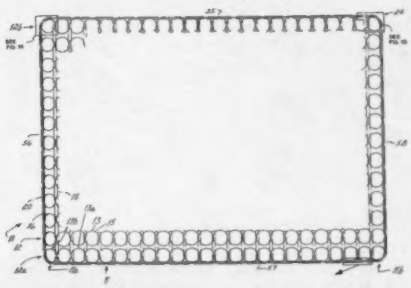
a newal post base comprised as a metal plate member generally rectangular in shape defined by first, second, third and fourth edges respectively and having top and bottom sides with transverse dimensions greater than the bottom surface of the newal post;

a first set of mounting holes in said plate member, said bottom surface of the newal post being positioned over said first set of mounting holes in surface contact with the upper side of the plate member, and a first set of linear fastening members extended from the bottom side of the plate member upwardly through the first holes into the bottom surface of the newal post to secure the newal post with respect to the base, said first set of mounting holes being positioned near the first of said edges centrally between adjacent edges and positioned to orientate a side of the newal post in flush relationship with said edge;

a second set of mounting holes located in said plate member and located proximate the second, third and fourth edges of said plate member in surrounding relationship to said newal post, and second linear fastening means extending from the upper surface of said plate member through the second set of mounting holes with respect to the floor type surface.

said holes of the first and second sets of holes being generally arranged in three rows on said plate member, a first row being disposed adjacent the first edge of said plate member and having two outer holes from said second set of holes and two intermediate holes from said first set of holes disposed centrally between the outer holes, a second row disposed intermediate between the first and third edges of said plate member and having two outer holes from said second set of holes and two intermediate holes from said first set of holes disposed centrally between the two outer holes, and a third row of holes disposed adjacent the third edge of said plate member comprised of four spaced apart holes from said second set of holes.

4,295,639
COIL SPRING ASSEMBLY AND FORMING METHOD
Thomas J. Wells, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Oct. 4, 1979, Ser. No. 81,818
Int. Cl.³ F16F *3/04*
U.S. Cl. 267—91 **36 Claims**



20. A coil spring assembly comprising a spring matrix, a border wire, and lacing wire,

said matrix comprising a plurality of rows of coil springs having end loops located in a common plane, said matrix having corner and edge coil springs located around the peripheral edge of the matrix,

said border wire having sides and corners located in close adjacency to border segments of the end loops of said edge and corner coil springs, and

said lacing wire being generally helical in configuration and being wrapped around said border wire and said border segments of said corner and edge coil springs to connect said border wire to said corner and edge coil springs, said lacing wire being operative to maintain the border segment of said corner coil springs in a deflected arcuate configuration contiguous to an arcuate corner section of said border wire, said deflected arcuate border segment of said corner coil springs being of different radius from the remainder of said end loop of said corner coil springs, said spring assembly being manufactured by the method of

locating said border wire in close adjacency to the outer peripheral border segments of said end loops of said corner and edge coil springs,

deflecting said border segments of said corner coil springs out of an initial configuration into a different configuration in which said border segments of said corner coil

springs are contiguous to and of approximately the same radius as an adjacent corner segment of said border wire,

wrapping said helical lacing wire around said border wire and around said border segments of said edge coils and around said deflected segments of said corner coil springs while maintaining the border segments of said corner coil springs deflected into said different configurations, and

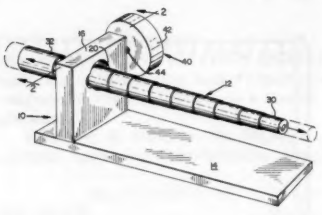
releasing said corner coil springs end loop segments from said deflected configurations after lacing the end loops of said sides and corner coil springs to said border wire.

4,295,640

JEWELER'S TOOL

Charles E. Merrell, 6318 SE. Aldercrest, Milwaukie, Oreg. 97222

Filed Jan. 7, 1980, Ser. No. 109,843
Int. Cl.³ B23Q *1/00*
U.S. Cl. 269—47 **4 Claims**



1. A jeweler's kit comprising:

a base;

a mandrel holder rigidly securable to the base, the holder including walls defining an opening for receiving a mandrel, one wall of the holder including a threaded hole extending therethrough into the opening;

an elongated ring mandrel provided with a plurality of working positions having circular cross-sections of differing diameters, the ring mandrel being insertable into the opening in the holder and selectively positional therein to permit each working position to be disposed in close proximity to the holder with the mandrel secured therein;

a bracelet mandrel provided with an oval-shaped working surface and having a shank extending outward from the working surface, the shank being insertable into the opening of the holder to secure the mandrel to holder, the shank including a threaded hole in an end thereof;

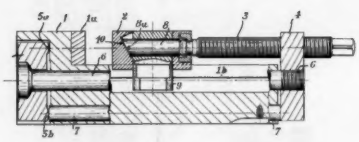
a fastener having a head and a threaded stud affixed to the head, the stud of the fastener cooperating at one time with the threaded hole in the holder to permit the ring mandrel to be rigidly secured in selected positions by selectively clamping the mandrel within the opening by adjusting the extension of the stud into the opening, the stud of the fastener cooperating at another time with the threaded hole in the shank of the bracelet mandrel to permit the bracelet mandrel to be rigidly secured in the holder by turning the stud until the head of the fastener and a wall of the bracelet mandrel are clamped tightly against opposite sides of the holder.

4,295,641

DEVICE FOR HOLDING A WORKPIECE TO BE MACHINED IN A SPECIFIC POSITION IN RELATION TO A MACHINE-TOOL ON WHICH IT MAY BE FIXED

Pierre Boucher, Objat, France, assignor to Etablissements Boucher Frères, France

Filed Feb. 20, 1980, Ser. No. 122,867
Claims priority, application France, Feb. 20, 1979, 79 04613
Int. Cl.³ B23Q *3/00*
U.S. Cl. 269—136 **11 Claims**



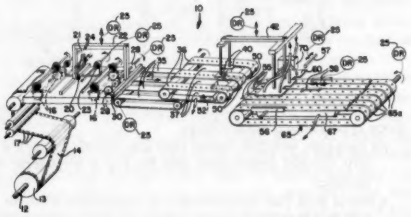
1. A device for holding a workpiece to be machined in a specific position in relation to a machine-tool on which this device may be fixed, even when it is subjected to a substantial clamping force, comprising a fixed jaw having two orthogonal reference surfaces, a jaw movable perpendicularly to one of these surfaces, and a clamping screw, also perpendicular to this surface, for clamping the machined workpiece between the fixed jaw and the movable jaw, and comprising furthermore a structure for receiving the reactions of the stresses exerted on the fixed and movable jaws, this structure having for this purpose a front part against which the fixed jaw bears and a rear part having therethrough a tapped orifice, through which the threaded portion of the clamping screw is meshingly engaged, the improvement consisting in the front and rear parts of this structure being each formed by a flange, and these two flanges being connected to one another, in the central part thereof, by at least one stay-rod parallel to the clamping screw and, in the lower part thereof opposite that where the clamping screw is to be found, by means of at least one compression bar.

4,295,642

ROLL FED SHINGLING MACHINE WITH PREDETERMINED NUMBERING

Robert J. Kelly, Dayton, Ohio, assignor to The Reynolds and Reynolds Company, Dayton, Ohio

Filed Oct. 15, 1979, Ser. No. 84,492
Int. Cl.³ B65H *39/02*; B42B *2/00*
U.S. Cl. 270—53 **11 Claims**



1. A unitary apparatus for processing a roll of a continuous web of forms into controlled sets of shingled forms, comprising:

(a) unwinding and advancing means for holding a roll of the web and unwinding and advancing the web from the roll,

(b) numbering means for receiving the web as it is advanced, numbering the forms in groups of predetermined count of at least two forms each, giving the forms in each group related numbers, and numbering the forms in consecutive groups consecutively,

(c) cutting means receiving the web and separating the numbered forms individually from the web,
(d) fastening means for securing together the separated individual forms of each group into separate, shingled, overlapped sets,
(e) said fastening means including a predetermined indexing position in said apparatus,
(f) conveyor means for receiving the separated forms from the cutting means and transporting them to a predetermined shifting location,
(g) means for transferring the separated forms individually from the shifting location to the indexing position, and
(h) shifting means for removing the forms from said conveyor and depositing them on said transferring means.

4,295,643

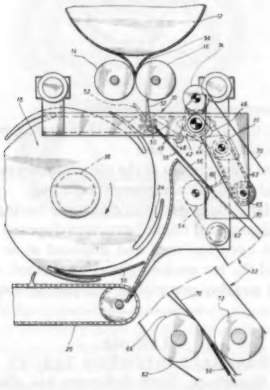
APPARATUS AND METHOD FOR HANDLING JACKETS OF PRINTED MATTER

Alejandro J. de la Vega, 629 Ote. Washington St., Monterrey, Nuevo Leon, Mexico

Continuation of Ser. No. 48,064, Jun. 13, 1979, abandoned, which is a continuation of Ser. No. 897,022, Apr. 17, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,591

Int. Cl.³ B65H *5/30*

U.S. Cl. 270—57 **16 Claims**



1. A method for feeding jackets of printed matter into an inserting machine which is synchronously driven directly by a rotary printing press, comprising the steps of:
diverting alternate jackets from a single press stream into multiple streams of slower throughput;
directing each of said multiple streams to a respective conveyor;
delivering the jackets on each conveyor to an inserting line of an inserting machine; and
prior to entering the inserting line, driving said conveyors at such speed so as to cause said jackets to be spaced apart at such distance so as to be compatible with the operation of the inserter.

4,295,644

DEVICE FOR STACKING THIN-WALLED BAGS

Leonard van der Meulen, Immeuble Saadi, Apt. 22A, Ariana, Tunisia

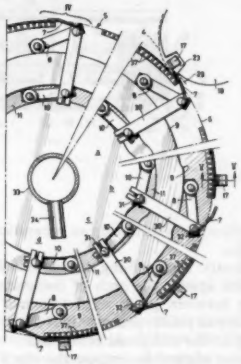
Filed Jul. 5, 1979, Ser. No. 54,937

Claims priority, application Netherlands, Dec. 9, 1978, 7807513

Int. Cl.³ B65H *39/08*

U.S. Cl. 270—60 **14 Claims**

1. In a device for assembling bags made of thin-walled material comprising
(a) a rotatable stacking drum which cooperates with a supply means and a discharge means, and which has one or more locations on the periphery of the drum for stacking material;
(b) primary clenching means for retaining stacked material against the periphery, the primary clenching means traveling in the rotational direction of the drum; and
(c) secondary clenching means which travel in a closed path outside the drum, part of the path following a portion of the periphery of the drum; the improvement comprising
(i) first primary clenching movement means for moving the primary clenching means tangentially relative to the stacking drum periphery between a first position adjacent a location for stacking material and a second position tangentially separated from said location; and



(ii) second primary clenching movement means for moving the primary clenching means radially relative to the stacking drum periphery between a first position pressing against the drum periphery or stacked material and a second position radially separated from the drum or stacked material; such that the movement of the primary clenching means in each of the radial and tangential directions is separately controllable and occurs sequentially, whereby the primary clenching means moves, in sequence, tangentially of the drum periphery, and then radially outwardly from the drum periphery.

4,295,645

DOCUMENT HOPPER WITH ECCENTRIC FLOOR CYLINDERS AND A FRONT AUGER

Rathindra Nahar, Wayne, and Robert H. Dietze, Bloomfield Hills, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 19, 1980, Ser. No. 122,508

Int. Cl.³ B65H *3/04*

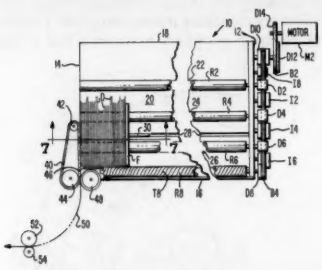
U.S. Cl. 271—34 **5 Claims**

1. A feeder hopper for feeding documents into the feeder nudger belts of a document sorter, comprising:
a base including an open-topped box having a bottom and walls for receiving stacks of documents;
a plurality of openings forming slots through the bottom of said box;
a plurality of rollers extending through the slots in the bottom of the box to serve as low friction supports for the edges of documents placed in the box;
means causing said rollers to rotate and contact edges of documents placed on edge in the box, thereby driving the documents in a first direction to force first ends of the documents against one wall of the box;
an opening forming a slot through said one wall of said box;
an additional roller extending through the slot in the one wall of the box in a position enabling it to engage said first ends of the documents;

means causing said additional roller to rotate in a manner to enable it to contact the first ends of the documents;

each of the plurality of rollers having an eccentric axis about which it rotates;

each eccentric axis enabling a roller, as it rotates, alternately to lift up and drop documents in contact with said roller, thereby lessening the effects of friction on and between the documents to prepare them for ready movement in a second direction substantially orthogonal to the first;



said additional roller having an eccentric axis about which it rotates;

said eccentric axis enabling the additional roller, as it rotates, to push against the ends of documents causing them to move between positions determined by motion of the plurality of rollers and positions determined by the eccentricity of the additional roller; and

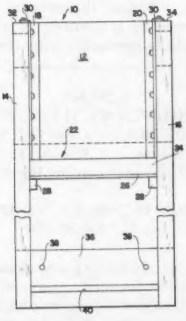
flag means aligned to engage the stack of documents and biased to force the documents in the second direction, thereby driving the documents in the second direction.

4,295,646

KARATE BOARD HOLDING AND STORAGE DEVICE

Dereck Squire, 265 Grove St., Apt. C-30, Elizabeth, N.J. 07202

Filed Nov. 5, 1979, Ser. No. 91,236
Int. Cl.[3] A63B *69/00*
U.S. Cl. 272—76 **8 Claims**



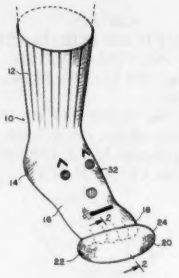
1. A board holding and storage device comprising a first shelf and a second shelf, a frame, said frame including four posts, said first shelf and said second shelf disposed in parallel spaced apart relationship and secured to said frame, said four posts including a first pair of posts and a second pair of posts, said first pair of posts joined to said second pair by a pair of angle members, said first shelf extending transverse to the longitudinal axis of said four posts, said second shelf being juxtaposed to said first shelf, means to mount said frame to a vertical supporting surface, means to removeably secure the marginal edges of a board to said frame disposing said board parallel and spaced apart from said supporting surface, whereby said first shelf is disposed located in a horizontal plane extending below said board when said board is positioned having said marginal edges thereof secured to said frame and whereby said second shelf is configured to provide vertical support to said board when said board is disposed having a lateral surface thereof resting on an uppermost lateral surface of said second shelf.

4,295,647

GAME AND ARTICLE FOR USE THEREWITH

James E. Daly, 321 A. Howell Rd., Malvern, Pa. 19355

Filed Mar. 17, 1980, Ser. No. 131,231
Int. Cl.[3] A63B *67/00*
U.S. Cl. 273—1 G **1 Claim**



1. An amusement article comprising:

(a) an open top sock having an ankle encasing portion, and a toe enclosing portion; and

(b) a padded enlargement at the toe enclosing portion of said sock, said padded enlargement including,

I. a tubular structure of textile material having its opposite ends closed, said tubular structure disposed transversely of said open top sock and disposed so as to protrude beyond the toe enclosing portion thereof, and

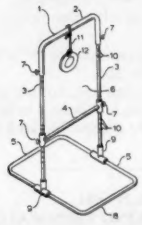
II. a soft padding material in said tubular structure.

4,295,648

BASEBALL PITCHER'S TARGET

Theodore D. Stromback, 20000 Delaware Ave., Detroit, Mich. 48240

Filed Nov. 22, 1978, Ser. No. 962,925
Int. Cl.[3] A63B *61/00*
U.S. Cl. 273—26 A **5 Claims**



1. A portable baseball pitcher's target for use as a game or practice device whereby said device may be readily assembled and adjusted comprising: a pair of vertical members spaced apart in fixed relationship to each other so that the distance between said members corresponds to the width of a baseball batter's strike zone; a pair of crossmembers spaced apart and extending across the vertical members with the end portions of at least one of the crossmembers in slideable engagement with

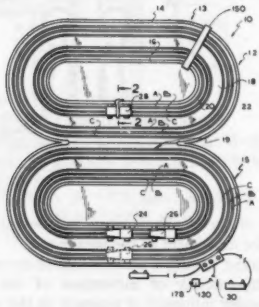
the vertical members so that the vertical distance between the crossmembers corresponds to the height of said strike zone and may be adjusted for a range of batter sizes; a means for locking the ends of said crossmembers to said vertical members; a target suspended within the strike zone bounded by said vertical members and said crossmembers whereby a particular area of said zone may be designated, a means for suspending the target within the strike zone comprising a cord having one end portion thereof attached to the target and the other end portion attached to one of the crossmembers whereby the target may be repositioned within the strike zone by varying the length of said cord and the point of attachment to said crossmember; and a means for supporting said vertical members to which the lower end portions of vertical members thereof are attached.

4,295,649

TOY MINIATURE VEHICLE RACING GAME

Julius Cooper, New Hyde Park, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Filed May 23, 1980, Ser. No. 152,904
Int. Cl.³ A63F *9/14*
U.S. Cl. 273—86 B **16 Claims**



11. A toy vehicle race game comprising a relatively flat slotless track having at least two track portions each having separate inner and outer lanes defining separate paths of travel, said track sections including unobstructed cross-over sections located adjacent each other defining a cross-over being at least four lanes wide through which toy vehicles may pass from one track section to another, a pair of controllable toy vehicles, means for selectively and independently controlling the controllable toy vehicles to cause them to switch lanes within a track portion and at said cross-over thereby to pass one another and cross from one path of travel to another; a drone vehicle and means for restraining the drone vehicle for movement in one of the lanes of one track portion thereby to provide an obstacle to vehicles crossing into said one track portion.

4,295,650

SURFACE PROJECTILE GAME WITH MALLETS AND THREE-SIDED TARGETS

Joseph D. Keeble, 17829 Lazy Dog Rd., Nevada City, Calif. 95959

Filed Apr. 7, 1980, Ser. No. 137,719
Int. Cl.³ A63B *71/02, 59/10*
U.S. Cl. 273—118 R **1 Claim**

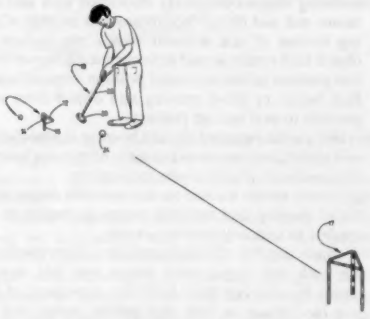
1. An amusement system for a plurality of player-contestants comprising:

A. a ball of a dimension suitable to permit the ball to be struck by a mallet, when positioned on a playing surface and propelled in rolling motion along segments of a course defined on said surface;

B. a plurality of portable, unitary three-sided targets adapted to be positioned on said playing surface in mutually spaced relation for dividing said surface into mutually spaced course segments, each of said targets being characterized by three legs of a substantially common length arranged in mutually spaced parallelism defining a pair of adjacent portals arranged in a pair of horizontally converging planes for accommodating passage of the ball, said legs being interconnected by three arms horizontally extended between adjacent ends of the legs and welded thereto;

C. a plurality of course markers, each marker being adapted to be positioned in spaced relation with one target of said plurality for indicating a segment of said course; and

D. a plurality of mallets for use by said player-contestants,



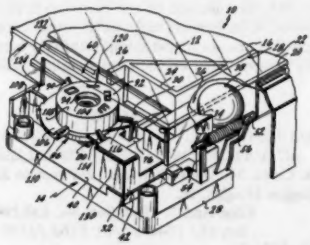
each mallet being characterized by an elongated head and a handle projected perpendicularly from the head, having defined at each of its opposite ends a planar striking surface of an area less than the cross-sectional area of the head and having a resilient covering affixed thereto, said head being tapered at its ends along three sides and said cross-sectional area being substantially of a half-round shape, with the curvature thereof being oppositely related to the handle, and said handle being of a length sufficient to permit a contestant to grasp the end portion of the handle opposite head and swing the head through an area having a length of at least 90°.

4,295,651

PINBALL ACTUATOR AND FEED MECHANISM

Yukio Konta, Gardena, Calif., assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jan. 21, 1980, Ser. No. 114,019
Claims priority, application Japan, Aug. 28, 1978, 53-117472
Int. Cl.³ A63F *7/24*
U.S. Cl. 273—121 D **14 Claims**



1. In a game having a playing surface an object feed and propulsion apparatus for propelling an object across said playing surface which comprises:

a housing associated with said playing surface;

an actuator means movably mounted on said housing and capable of moving from a rest position to an activated position, said actuator means including an actuator-object

contact surface, said actuator means capable of propelling said object across said playing surface when said actuator means moves from said activated position to said rest position and said object is located in an abutting relationship with said actuator-object contact surface;

an object feed means movably mounted on said housing and capable of contacting an object when said object is in a first position wherein said object is located adjacent to said object feed means and moving said object from said first position to a second position wherein said object is located in said abutting relationship with said actuator-object surface;

connecting means operatively associated with said actuator means and said object feed means and capable of translating motion of said actuator means into motion of said object feed means as said actuator means moves from said rest position to said activated position to cause said object feed means to move moving said object from said first position to said second position;

movable means mounted on said housing in association with said object feed means and capable of moving independent of movement of said object feed means;

engagement means located on said movable means and capable of moving said movable means in respect to a force applied to said engagement means;

said object capable of simultaneously cooperatively engaging both said engagement means and said object feed means transferring force from the movement of said object feed means to said engagement means and to said movable means to move said movable means simultaneously as said object is transferred from said first position to said second position.

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GOLF BALL

Tasuku Saito, Tokorozawa; Tutomu Noma, Higashimurayama; Tsutomu Matsunaga, Iruma; Nagayoshi Naito, Nagoya; Chiaki Tanaka, Chita, and Motoki Hiratsuka, Nagoya, all of Japan, assignors to Bridgestone Tire Co., Ltd. and Toray Industries, Inc., both of Tokyo, Japan

Filed Feb. 8, 1980, Ser. No. 119,640

Claims priority, application Japan, Feb. 15, 1979, 54-16339

Int. Cl.[3] A63B *37/12*

U.S. Cl. 273—235 R **7 Claims**

1. A golf ball comprising a thread-wound central core and an outer cover for the core, said cover being formed of, as a main ingredient, a block copolyetherester comprising (A) a terephthalic acid unit, (B) a 1,4-butanediol unit, (C) a unit of a dicarboxylic acid, other than terephthalic acid, or a short-chain diol, other than 1,4-butanediol, having a number-average molecular weight of not more than 300 and (D) a poly(alkylene oxide) glycol unit having a number-average molecular weight of from 500 to 3000, the amount of the component (C), being 25/75 through 60/40 in terms of mol ratio to either component (A) or (B), and the amount of the component (D) being 35 through 70% by weight based on the total weight of the copolymer.

4,295,653

PRESSURE-COMPENSATED DIAPHRAGM SEALS FOR ACTUATORS, WITH SELF-EQUALIZATION

Carl R. Coles, Michigan City, Ind., assignor to Zero-Seal, Inc., Arlington Heights, Ill.

Filed Apr. 7, 1980, Ser. No. 138,199

Int. Cl.[3] F04B *21/00*; F16J *15/50*

U.S. Cl. 277—2 **12 Claims**

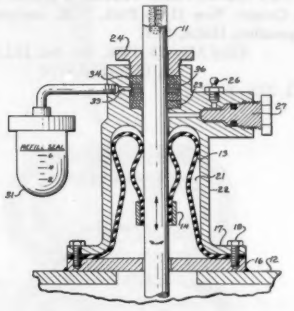
1. A sealed transmission device for use in conjunction with apparatus having a working environment therein to be sealed reliably from the external environment and expected to exhibit substantial pressure and within which a function is to be performed by the transmission device; said transmission device including:

a. a seal housing for sealed communication with the working environment and having an opening exposed to the external environment;

b. a movement transmission means extending movably through said opening;

c. a pressure-withstanding seepage-prone seal normally preventing substantial leakage through said opening while permitting movement of the transmission means, and subject to possible leakage-causing impairment by such movement;

d. an impervious flexible membrane, cooperating with said housing and said transmission means to allow said transmission means to perform a function in the working environment, and to form a hermetic seal between the working environment and said opening and to form a confined space for a sealing liquid between said opening and said membrane; the housing characteristics being such that the



volume of the confined space is substantially constant except for movement of the membrane;

said membrane having a portion free to move, extensively and independently of movement of the transmission means, under influence of pressure of the working environment to accommodate itself to the volume of the confined sealing liquid to maintain that liquid at a pressure on the outer face of the membrane substantially equal to the pressure exerted on the inner face by the working environment;

said device including means effective, in the event of failure of said pressure-withstanding seal, to limit the yielding of the membrane to a safe amount and maintaining a protective pressure on the outer face of the membrane, and at the same time to form a temporary seal between the confined space and the opening permitting the servicing of said pressure-withstanding seal.

4,295,654

SEAL ASSEMBLY FOR A LINKAGE

Toshio Kawamura, Isehara; Noboru Harashima; Hideo Ueda, both of Hiratsuka, and Seijiro Sano, Ninomiya, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 12, 1980, Ser. No. 148,585

Claims priority, application Japan, May 11, 1979, 54-61766[U]; Oct. 5, 1979, 54-137432[U]; Oct. 5, 1979, 54-137433[U]

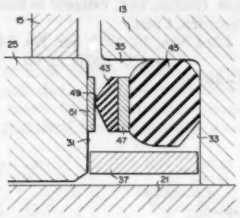
Int. Cl.[3] F16J *15/34, 15/32*

U.S. Cl. 277—92 **6 Claims**

1. A seal assembly in an annular cavity formed by first and second members which are subject to relative rotation, the first member forming an axially facing end wall and a radially facing side wall of the cavity, the second member having an end face forming another axially facing end wall of the cavity opposite the one axially facing end wall, said seal assembly comprising:

a load ring of resilient elastomeric material disposed in said cavity adjacent the end wall of said first member;

a seal ring of wear-resistant elastomeric material bonded to said load ring, said seal ring having a lip formed thereon; and



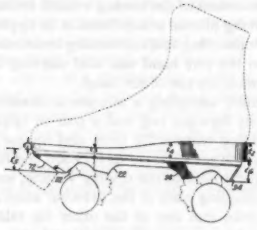
a wear-resistant annular plate bonded to the end face of said second member whereby said load ring is axially compressed between said first and second members thereby urging said lip into sealing contact with said wear-resistant annular plate.

4,295,655

ROLLER SKATING SHOE

David L. Landay, Brookline, and Alvan H. Wolf, Worcester, both of Mass., assignors to Brookfield Athletic Shoe Company, Inc., East Brookfield, Mass.

Filed Jul. 18, 1979, Ser. No. 40,093
Int. Cl.³ A63C *17/02*
U.S. Cl. 280—11.2 **10 Claims**



1. A roller skating shoe comprising

an integral sole-chassis unit injection molded from semi-rigid plastic material,

an upper which is in-situ bonded to said sole-chassis unit during molding thereof,

front and rear threaded connecting means,

each said threaded connecting means being permanently embedded within the interior of said injection-molded sole-chassis unit during molding thereof,

each said connecting means including one or more transversely extending portions embedded within said sole-chassis unit for resisting pull out and other forces on said connector means,

front and rear skate wheel hangers connected to and retained by said threaded connector means,

each of said hangers also including a strut element forming a second connection between said hanger and said sole-chassis unit, and

roller skate wheels rotatably mounted on said hangers,

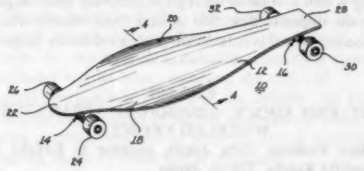
said sole-chassis unit providing a substantial mass of semi-rigid plastic material in the region of said front and rear hangers for structurally supporting said hangers.

4,295,656

SKATEBOARD HAVING FLEXIBLE SIDES

Arlan G. Moore, Vail, Colo., assignor to C. Robert von Hellens, Phoenix, Ariz.

Filed Jul. 2, 1979, Ser. No. 53,688
Int. Cl.³ A63C *17/02*
U.S. Cl. 280—87.04 A **4 Claims**



1. A road skateboard, said skateboard having a wheel truck vertically dependingly mounted at the nose and at the tail of said skateboard, said skateboard comprising in combination:

(a) a board;

(b) a flexible upwardly convexly curved spine extending along the longitudinal axis of said board for providing structural support intermediate the wheel trucks;

(c) a pair of flexible wing sections for modifying the resilient resistance to flexing of said board and for establishing a supporting surface for a skater's feet and for providing a shock absorber to smooth the ride and for providing a lateral moment arm to encourage tilting of said board about the longitudinal axis in response to a lateral weight shift by the skater, each wing section of said flexible pair of wing sections extending laterally and upwardly from one side of said spine intermediate the nose and tail of said board in the quiescent state and being flexibly deflectable downwardly relative to the spine of said board and with respect to its configuration in the quiescent state in response to any force applied by the skater and thereby proportionally modifying the resilient resistance of said board; and

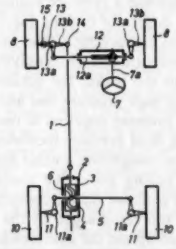
(d) means incorporated within the wheel trucks for reorienting the wheel axles of the wheel trucks in opposed angular deviations in response to tilting of said board and flexing of said board when tilted;

4,295,657

STEERING APPARATUS FOR VEHICLES

Shoichi Sano, Tokorozawa, and Yoshimi Furukawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 107,718
Claims priority, application Japan, Dec. 29, 1978, 53-163681
Int. Cl.³ B62D *7/00*
U.S. Cl. 280—91 **8 Claims**



1. A steering apparatus for a four-wheeled vehicle wherein a rotational movement of a steering wheel of the vehicle is

converted into a straight-line motion through a steering gear for turning the front wheels of the vehicle, wherein:

the rear wheels of the vehicle are also dirigible; and

means are provided for changing a turning direction of said rear wheels with respect to the front wheels of the vehicle, in response to the amount of rotation of said steering wheel, such that said rear wheels are concurrently turned in the same direction as said front wheels when said steering wheel is rotated through a relatively small angle, and in the opposite direction of said front wheels when said steering wheel is rotated through a relatively large angle.

4,295,658

FRONT END SHOCK ABSORBING APPARATUS FOR WHEELED VEHICLE

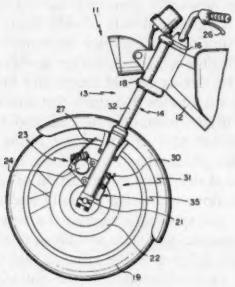
Mitsuhiro Kashima, Gifu, Japan, assignor to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1979, Ser. No. 29,999

Claims priority, application Japan, Apr. 17, 1978, 53-45021

Int. Cl.³ B62K *25/08*

U.S. Cl. 280—276 **9 Claims**



1. A shock absorbing suspension apparatus for a front end of a wheeled vehicle having brake means, the apparatus including a telescopic shock absorber having a first fluid chamber and a second fluid chamber containing a fluid which is urged to flow from the first chamber to the second chamber upon compression of the shock absorber for shock absorption, wherein the improvement comprises:

valve means disposed between the first and second chambers;

actuator means responsive to the brake means for controlling the valve means to progressively restrict fluid flow therethrough as a degree of braking force applied by the brake means to the vehicle increases;

the valve means comprising a check valve which is normally closed and urged to open by fluid pressure in the first chamber, the actuator means being constructed to progressively increase a pressure required to open the check valve as the degree of braking force increases;

the brake means comprising a fluid pressure actuated brake and a high pressure line for supplying high pressure actuating fluid to the brake, the actuator means being connected to the high pressure line and constructed so as to increase the pressure required to open the check valve as the actuating fluid pressure increases;

the valve means comprising a valve element and a compression spring urging the valve element toward a closed position, the actuator means comprising an actuator rod, the actuator rod being urged by the high pressure actuating fluid to compress the compression spring;

the actuator means further comprising a stop, the compression spring urging the actuator rod toward engagement with the stop; and

an adjustment spring urging the actuator rod toward the stop and adjustment means for adjusting a force exerted by the adjustment spring on the actuator rod.

4,295,659

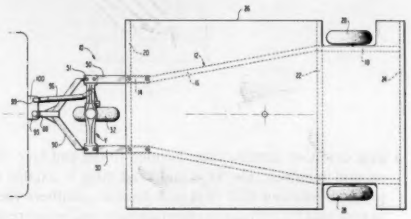
STEERABLE SELF-SUPPORTING TRAILER

Joseph Mergen, Goshen, Ind., assignor to Bangor Punta Corporation, Greenwich, Conn.

Filed Nov. 15, 1979, Ser. No. 94,526

Int. Cl.³ B62D *13/00*

U.S. Cl. 280—405 R **18 Claims**



1. A self-supporting trailer system for coupling at its forward end to a towing vehicle comprising:

an elongated frame,

at least a pair of wheels carried by said frame,

a yoke connected to said frame at its forward end and having a pair of arms,

a front wheel,

means connecting said front wheel and said yoke one to the other for pivotal movement of said front wheel about a substantially vertical axis extending substantially medially between the outer ends of said yoke arms,

means for steering said front wheel in accordance with the turning movement of the towing vehicle including a steering link having pivotal connections at its opposite ends for pivotally connecting said connecting means and said steering link on the one hand and said steering link and the towing vehicle on the other hand,

a hitch assembly including a bifurcated drawbar having a tongue at its forward end and a pair of laterally spaced arms extending rearwardly from said tongue, means carried by said tongue adjacent its forward end for releasably coupling said trailer to the towing vehicle, and means for pivotally coupling each of the drawbar arms and a corresponding yoke arm one to the other for relative pivotal movement about a generally horizontal axis,

the pivotal connections carried by said tongue and the coupling means between said drawbar arms and said yoke arms defining a plane, the pivotal connections carried by said steering link constituting universal joints lying in said plane whereby the steering link connections are maintained in said plane throughout the range of relative pivotal movement between said drawbar and said yoke.

4,295,660

ACTIVE SUSPENSIONS ASSEMBLY FOR A MOTOR CAR

Gabriele Toti, Milan; Giuliano Lenzi, Arese, and Paolo Monti, Lazzate, all of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

Filed May 30, 1979, Ser. No. 43,793

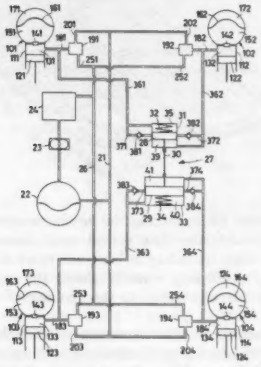
Claims priority, application Italy, Jun. 8, 1978, 24338 A/78; Mar. 29, 1979, 21421 A/79

Int. Cl.³ B60G *11/26*

U.S. Cl. 280—714 **10 Claims**

1. Active suspensions for a motor vehicle equipped with a car body which is the suspended mass and wheels which are the non-suspended mass, said suspensions comprising usual resilient means and shock-absorbing means inserted between the car body and the wheel hubs, telescopable stay tubes filled

with liquid and inserted, each, between the car body and the hub of a car wheel, level-adjusters operatively connected to said telescopable stay tubes, said level-adjusters being composed by valve means for establishing communication between said telescopable stay tubes alternately with a source of pressurized liquid and with a sump, said valve means comprising means responsive to the variations of the mutual distance between the car body and every wheel, said responsive means being connected to the car body itself and to the hub of every wheel through means for filtering off the signals indicative of said variations of such mutual distance so that the signals originated by shocks due to road unevenness are not detected, said responsive means being operatively connected to said valve means to command them to establish a communication



between said stay tubes and the source of pressurized liquid when a depression of the car body relative to the respective wheel is detected and for commanding them to establish a communication between said stay tubes and the sump when a lift of the car body relative to the respective wheel is detected, said suspensions being characterized in that each of said telescopable stay tubes is operatively connected to a level-adjuster of its own and is also operatively connected to a load-shift adjuster, said load-shift adjuster being means for controlling the distribution ratio of the load shifts between heavily loaded wheels and lightly loaded wheels in the front and the rear wheel assemblies under combined conditions of vehicle pitching and of vehicle rolling by properly interconnecting the stay tube relative to the respective wheel of at least on wheel assembly.

4,295,661

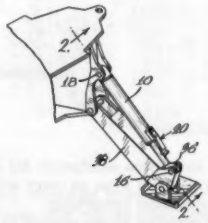
LATCHING MECHANISM FOR MACHINE STABILIZER ARMS USING HYDRAULIC CYLINDERS

Herman J. Maurer, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 10, 1980, Ser. No. 111,099

Int. Cl.³ B66C *5/10*

U.S. Cl. 280—765 **6 Claims**



1. In a mobile machine having at least one outrigger arm pivotally mounted thereon and movable between a lower ground-engaging position and a raised and inactive position powered by a hydraulic cylinder including a cylinder housing and a cylinder rod, said outrigger arm being adapted to provide lateral stabilization for the machine; a latching mechanism for the hydraulic cylinder releasably latching the cylinder rod in a retracted position, the latching mechanism comprising:

a generally flat spring having a generally V-shaped raised portion at one end and mounted at its other end to the cylinder housing so that the raised portion end of the spring extends beyond the end of the cylinder housing with the raised portion extending generally toward the cylinder rod without contacting the rod; and

a radial protrusion at the end of the cylinder rod extending beyond the diameter of the rod such that the radial protrusion contacts and coacts with the raised portion of the spring as the cylinder rod is retracted,

whereby movement of the cylinder rod from an extended position end of the spring, which is otherwise free from contacting the cylinder rod, to contact and slide completely over the protrusion at the end of the cylinder rod when the cylinder rod reaches a preselected retracted position relative to the cylinder housing, and whereby the cylinder rod is held from extension by a spring retention force less than the hydraulic actuation force of the cylinder, until an unlatching extension force larger than the spring retention force is exerted upon the cylinder rod to overcome the spring retention force and allow extension of the rod beyond the preselected retracted position.

4,295,662

IMAGE WISE DEVELOPABLE SYSTEM

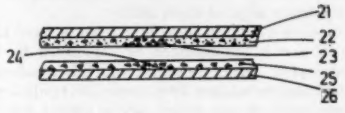
Geoffrey C. Tutty, Christchurch, New Zealand, assignor to INCA Limited, Christchurch, New Zealand

Division of Ser. No. 79,258, Sep. 27, 1979, which is a continuation-in-part of Ser. No. 930,013, Aug. 1, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,435

Claims priority, application New Zealand, Aug. 2, 1977, 184811; Feb. 8, 1978, 186415

Int. Cl.³ B41M *5/16, 5/18, 5/20, 5/22*

U.S. Cl. 282—27.5 **6 Claims**



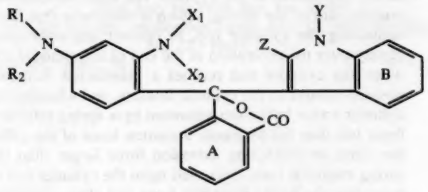
1. An imagewise developable system comprising (I) a substrate supported mixture of (1) a free base of a cationic solvent dye in OH^- form, said dye being capable of developing a color or a more intense color upon reaction with an organic acid developing agent, and (2) a binder which (i) is non-polar and non-acid, (ii) does not develop said free base and (iii) is soluble in ASTM class 1 solvents; and (II) a substrate supported organic acid developing agent which is substantially non-crystalline and melts, sublimes or decomposes at a temperature between 50° C. and 400° C., said organic acid developing agent not being in the reactive presence of said free base of a cationic solvent dye in OH^- form, but being selectively migratable to imagewise develop the said free base under an action selected from the group consisting of (a) applying selective imagewise pressure to the system, (b) applying selective imagewise heat to the system and (c) applying selective electrical discharge to the system.

4,295,663
3-INDOLYL-3-BIS-AMINO-PHENYL-PHTHALIDE COMPOUNDS

Jean C. Petitpierre, Kaiseraugst, Switzerland, and Robert Garner, Bury, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 971,768, Dec. 21, 1978, Pat. No. 4,252,975, which is a division of Ser. No. 758,259, Jan. 10, 1977, Pat. No. 4,153,609. This application Aug. 25, 1980, Ser. No. 181,016
Claims priority, application Switzerland, Jan. 16, 1976, 516/76
Int. Cl.³ B41M *5/16, 5/18, 5/22*
U.S. Cl. 282—27.5 **9 Claims**

1. A pressure- and/or heat-sensitive recording material comprising a support which contains, or has coated thereon as colour former at least one 3-indolyl-3-bis-aminophenyl-phthalide colour former of the formula



wherein

R_1 represents alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, cycloalkyl, or unsubstituted or substituted phenyl or benzyl wherein the substituents are halogen, nitro, lower alkyl or lower alkoxy,

R_2 represents hydrogen, alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, cycloalkyl, or benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy, or

R_1 and R_2 together with the nitrogen atom linking them represent a 5- or 6-membered heterocyclic radical,

X_1 and X_2 independently of one another represent hydrogen, lower alkyl, cycloalkyl, benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy, or acyl having 1 to 8 carbon atoms, and X_1 also represents phenyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy,

Y represents hydrogen, alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl or cyano, or benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy,

Z represents hydrogen, lower alkyl or phenyl, and the rings A and B independently of one another are unsubstituted or substituted by halogen, nitro, amino or lower alkylamino.

4,295,664
MEDICATION RECORD-KEEPING PACKAGE

Gloria T. Cutting, 1426 Camden Ave., Los Angeles, Calif. 90025

Continuation of Ser. No. 741,454, Nov. 12, 1976, abandoned. This application Oct. 11, 1978, Ser. No. 950,306
Int. Cl.² B42D *15/00*
U.S. Cl. 283—1 A **16 Claims**

1. A medication record-keeping package for hospital use comprising:

a retention sheet having a plurality of parallel, spaced-apart, adhesive strips thereon;

a plurality of elongated, separately removable protective strips overlying and adhering to said adhesive strips;

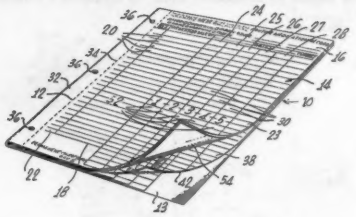
a cover sheet overlying said retention sheet and said protective strips;

a plurality of transfer sheets each of a different size, said transfer sheets being arranged between said cover sheet and said retention sheet in order of increasing size;

pressure sensitive duplication coating means for reproducing on said retention sheet and said transfer sheets information recorded on said cover sheet;

binding means for releasably attaching said retention sheet, said transfer sheets, and said cover sheet in a predetermined overlying relationship; and

a plurality of administration columns delineated on said cover sheet and at least one such column delineated on each of said transfer sheets, each of said columns providing a space for recording the administration of medicine during a particular time period, each successively wider transfer sheet including at least one more of said columns than the preceding transfer sheet, the spacing of said columns corresponding to the spacing of said adhesive strips,

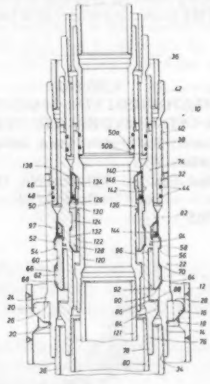


whereby said retention sheet can be detached from said binding means, and said transfer sheets can be sequentially detached from said binding means and attached to said retention sheet along said adhesive strips and thereby combined to provide a progressively updated supplemental record of the information recorded on said cover sheet.

4,295,665
WELL CASING SUSPENSION SYSTEM

Elwood K. Pierce, Coldspring, Tex., assignor to Petroleum Designers, Inc., Houston, Tex.

Filed Sep. 4, 1979, Ser. No. 72,068
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—3 **13 Claims**



1. A well casing suspension mechanism for suspending an inner well casing within and from an outer well casing, said casing suspension mechanism comprising:

casing suspension coupling means adapted to be connected to outer well casing extending into a well bore, said coupling means being formed internally to define an internal

key recess means and internal lock recess means, said lock recess means defining upwardly directed stop shoulder surface means and said key recess means defining internal tapered surface means;

a tubular hanger body being receivable within said coupling means and being connectable to said inner well casing and defining an external lock receiving recess, an external key receiving recess and an external lock positioner recess, said tubular hanger body further defining external tapered downwardly directed shoulder means;

a split ring type locking element being movably positioned about said tubular hanger body and defining lock means adapted to be received within said lock recess means and in engagement with said stop shoulder surface means, said locking element defining key means adapted to be received within said key recess means, said key means defining external tapered surface means being engagable with said internal tapered surface means of said key recess means, said locking element being of spring nature and being normally expanded to a position locating said lock and key means respectively within said lock and key recess means, said locking element being radially contractable by externally applied mechanical force by reaction of said internal and external tapered surface means to withdraw said lock and key means from said lock and key recess means, in said radially contractable condition said locking element being at least partially received within said external lock receiving recess of said tubular hanger body; and

split ring type lock positioning means being received between said tubular hanger body and said casing suspension coupling means and being of spring nature normally contacting said lock positioning element into said lock positioner recess of said tubular hanger body, said lock positioning element being positioned for contact by said tapered downwardly directed shoulder means upon downward movement of said hanger body relative thereto and being radially movable by reacting engagement thereof by said downwardly directed shoulder means against the spring tension thereof into load supporting engagement with said casing suspension coupling and into load transferring engagement with said locking element, said locking element supporting said lock positioning means during said radial movement of said lock positioning means.

4,295,666

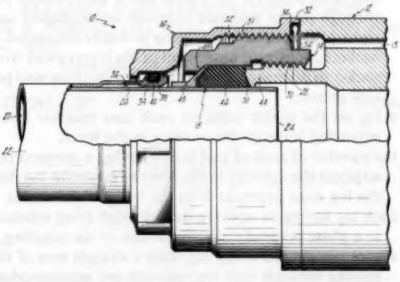
SHROUDED TUBE AND COUPLING THEREFOR

Donald G. Melanson, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 5, 1979, Ser. No. 91,680

Int. Cl.³ F16L *19/02*

U.S. Cl. 285—14 **3 Claims**



1. A coupling fabricated from aluminum for attaching an inner fuel carrying tube and an outer containment tube, said coupling having an attaching member having a central passage in axial alignment with the opening in the inner fuel carrying tube, a seating surface at the mating end of said attaching member, a concentric threaded surface axially spaced from said seating surface, a flexible rubber composite sealing element, toroidal in shape frictionally fitted on the outer diameter of said inner fuel carrying tube, a collar on said latter mentioned tube axially restraining said sealing element,

an inner nut having a concentric threaded surface on its inner diameter and a concentric threaded surface on its outer diameter both of said threaded surfaces being disposed on the end adjacent said concentric threaded surface on said attaching member and said threaded surface on the inner diameter being threadably engageable therewith,

an outer nut having a concentric threaded surface on its inner diameter threadably engaging said outer threaded surface of said inner nut,

said inner nut having a depending shoulder engageable with said collar for urging said sealing element in sealing engagement with said seating surface and urging the end of said inner tubes into said central passage, said outer diameter of said inner fuel carrying tube and said inner nut upon coupling said outer nut to bear against said attaching member and a ferrule at the end of said sealing element mounted on the end of said inner fuel carrying tube for preventing the rubber composite material from extruding when said sealing element engages said seating surface.

4,295,667

ROTARY PIPE SWITCH

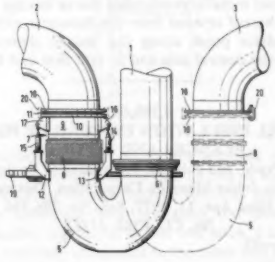
Gernot Zahs, and Hans-Jürgen Wahle, both of Dortmund, Fed. Rep. of Germany, assignors to Vacmetal Gesellschaft für Vakuum-Metallurgie mbH, Dortmund, Fed. Rep. of Germany

Filed Aug. 2, 1979, Ser. No. 62,933

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 7825611[U]

Int. Cl.³ F16L *55/00*

U.S. Cl. 285—18 **8 Claims**



1. A rotary pipe switch for selectively interconnecting a central pipe to a selected one of a plurality of distributing pipes arranged in a circular pattern around said central pipe comprising a pipe elbow having a first end and a second end with a curved portion therebetween, rotary joint means at said first end for connecting said pipe elbow to a central pipe and for enabling rotary motion of said pipe elbow relative to said central pipe, axial compensator means located intermediate said curved portion and said second end of said pipe elbow, connector means attached at said second end of said pipe elbow for enabling connection and disconnection of said second end of said elbow to and from a distributing pipe, and at least two adjusting devices attached to said connector means, said adjusting devices and said axial compensator means being structured to enable axial movement of said connector means toward and away from each of a plurality of distributing pipes to enable said connector means to be attached with and detached from said distributing pipes, said rotary pipe switch also including means at said second end for driving said pipe elbow

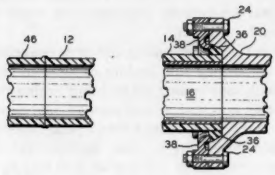
to enable selective attachment and detachment of said central pipe and said distributing pipes.

4,295,668

ADAPTER FOR CONNECTING PLASTIC PIPE SYSTEM TO CAST IRON PIPE SYSTEM

Jean H. Louthan, Dallas, Tex.; Russell C. Cox, Taylor, S.C., and William V. Crawford, Williamstown, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 27, 1979, Ser. No. 52,900
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—21 **18 Claims**



1. Adapter means for connecting a plastic pipe system to a metallic pipe system, comprising:

(a) an elongated, plastic sleeve having a substantially equal wall thickness throughout its length and having a first end adapted to be joined to said plastic pipe system and a second end adapted to be joined to said metallic pipe system; and

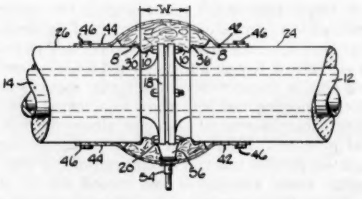
(b) an elongated, metallic reinforcing sleeve, having an outside diameter substantially equal to the inside diameter of said second end of said plastic sleeve and a length less than the length of said plastic sleeve and mounted in said second end of said plastic sleeve with a first end thereof terminating inside said plastic sleeve intermediate the ends of said plastic sleeve and a second end thereof terminating flush with said second end of said plastic sleeve, said first end of said metallic reinforcing sleeve having a significant length thereof tapered from the diametric exterior and an intermediate point along the length thereof inwardly toward the central axis and to said first end thereof.

4,295,669

THERMAL INSULATION ESPECIALLY FOR PIPE, FLANGES AND FITTINGS

Steve A. LaPrade, and John M. Pallo, both of Englewood, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 11, 1977, Ser. No. 786,746
Int. Cl.³ F16L *11/12*
U.S. Cl. 285—47 **9 Claims**



1. A thermal insulation device for insulating irregularly shaped objects such as pipe flanges and fittings which comprises:

(a) a single flexible thermal insulation member which has a width at least equal to the width of the object to be insulated and a length equal to the circumference of the object to be insulated;

(b) a single flexible cover sheet having a width and length each greater than the respective width and length of said thermal insulation member, and to one side of which said thermal insulation member is adhered, said cover sheet forming the outer surface of said thermal insulation device when said device is installed;

(c) detection means passing through said thermal insulation member and said cover sheet to detect leakage of fluid from said object to be insulated and to provide observable indication outside of said thermal insulation device that leakage has occurred from said object; and

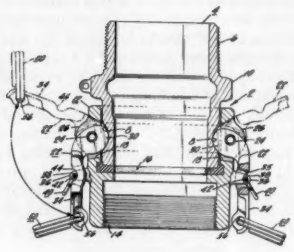
(d) securing means to removably secure said device in position surrounding said object to be insulated.

4,295,670

QUICK-DISCONNECT CAM LOCKING SAFETY COUPLING

Richard B. Goodall, Worton, and Richard L. Goodall, Chestertown, both of Md., assignors to Dixon Valve & Coupling Co., Chestertown, Md.

Filed Jun. 11, 1980, Ser. No. 158,501
Int. Cl.³ F16L *37/18*
U.S. Cl. 285—91 **3 Claims**



1. A quick-disconnect cam locking safety coupling comprising:

a hollow male plug having an external peripheral groove,

a socket receiving said male plug and having a pair of opposed side openings opposite said peripheral groove,

a gasket for sealing between the male plug and the socket,

a pair of cam members each having a lever with an opening and lying adjacent the socket and a cam portion passing through one of said side openings and engaging said peripheral groove and each being pivotally connected to the socket for outward movement of the levers away from the socket to disengage the cam portions from the said peripheral groove,

a lug on the socket adjacent each cam member lever and extending through the opening in the lever,

the exterior of each of said levers having a recessed portion adjacent the opening in the lever to minimize the distance the lug must protrude from the body of the socket,

each lug having an opening therethrough lying substantially in a plane perpendicular to the axis of the coupling, and

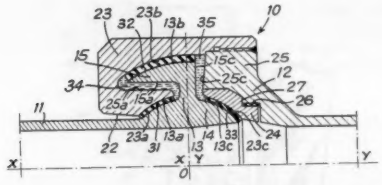
a wire pin clipped to the lug with a straight arm of the pin passing through each lug opening and accommodated in the recessed portion of the adjacent lever to hold the adjacent cam member in the groove engaging position, and a bent arm of the pin outside the lug and having a bent portion on each side of the lug to center and lock the pin onto the lug.

4,295,671

FLEXIBLE UNION WITH PASSIVE COMPENSATION

Jean C. Clebant, Carbon-Blanc, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Aug. 27, 1979, Ser. No. 69,738
Claims priority, application France, Sep. 19, 1978, 78 26846
Int. Cl.[3] F16L 27/10
U.S. Cl. 285—223 5 Claims



1. A flexible union for connecting together first and second rigid tubular sections capable of oscillating with respect to each other about a central point with a limited angular amplitude, said union comprising:

a first rigid body fast with or forming part of said first tubular section, said first body having an annular projecting portion at one end of said first tubular section, and said projecting portion having a front external surface directed toward said second tubular section and a back external surface directed toward said first tubular section;

a second rigid body fast with or forming part of said second tubular section, said second body having an annular recess completely surrounding said projecting portion and defining therewith an annular gap, said first and second bodies being entirely separated from each other by said annular gap bordered by first and second surfaces belonging respectively to said first and second bodies;

at least a first and a second separate elastic annular elements located in said gap, each element being formed in one piece and having inner and outer faces bound to annular surfaces having the shape of spherical surface parts belonging respectively to said first and second surfaces; and

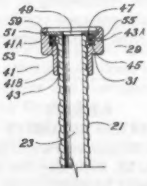
at least one closed annular chamber formed in said gap between said first and second elastic elements and having opposite walls belonging respectively to said first and second bodies, said chamber being completely filled with a substantially non-compressible liquid and being adjacent to at least a portion of the rearward surface of said projecting portion so as to allow the transmission of axial traction forces between said first and second tubular sections through said liquid.

4,295,672

FLEXIBLE TUBE TERMINATING MEANS

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Filed May 14, 1979, Ser. No. 38,650
Int. Cl.[3] F16L 13/08
U.S. Cl. 285—287 8 Claims



1. A fitting located around the end portion of a tube and having a shoulder for engagement by a threaded coupling member, said fitting having a first annular portion located around the end of said tube and a second annular portion located around said tube and extending from said first annular portion, said first annular portion having a diameter greater than that of said second annular portion defining said shoulder therebetween, comprising:

first and second annular members attached together and to said tube by fused metallic means,

said first annular member comprising annular means connected to said first annular portion and defining a generally flat annular surface engaging the end face of the terminal end of said tube and extending radially outward therefrom defining one end of an annular cavity surrounding the exterior of said tube,

said second annular member comprising an annular portion connected to said second annular portion and spaced axially inward from said generally flat annular surface of said annular means and defining an opposite end of said cavity spaced axially inward from said one end of said cavity,

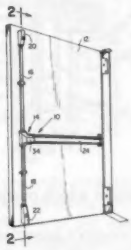
said fused metallic means being located in said cavity bonding said first and second annular members together and to said tube.

4,295,673

VERTICAL ROD EXIT DEVICE

Theodore H. Miller, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

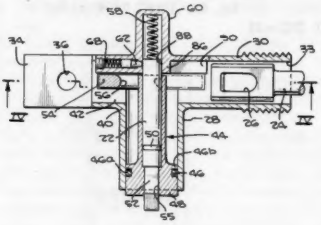
Filed Oct. 9, 1979, Ser. No. 82,538
Int. Cl.[3] E05C 9/04, 15/02
U.S. Cl. 292—21 16 Claims



1. In a vertical rod exit device for securing an outwardly opening door in closed position and having at least one latch, means for mounting the one latch on the inner face of the door, a vertically extending latch operating rod having one end portion operably connected to said one latch, a latch rod shift mechanism operably connected to the other end portion of the latch operating rod, means for mounting said shifting mechanism on the inner face of the door, a rotary outside latch operator for attachment to the outer face of the door and journalled for angular movement about a horizontal axis normal to the faces of the door, the vertical extending latch operating rod being horizontally offset from said horizonal axis and in the direction of the free side edge of the door, the rod shifting mechanism being operable to shift the latch operating rod in one vertical direction and to a latch releasing position in response to operation of the rotary outside latch operator, and an inside latch actuator operably associated with the latch shifting mechanism and at all times operable independently of the outside latch operator to shift the latch operating rod in the one direction and to a latch releasing position in response to pressure applied in a door opening direction to the inside latch actuator, the improvement wherein said rod shifting mechanism includes a frame assembly comprising said mounting means, a rod connector, means supporting said rod connector for limited reciprocal vertical movement on and relative to said frame assembly, means for connecting said latch operating

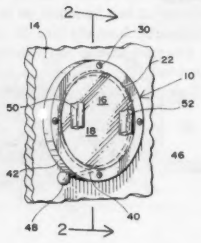
rod to said rod connector, actuating means for moving said rod and said rod connector in said one vertical direction in response to pressure applied in a door opening direction to said inside latch actuator, a key plate, means supporting said key plate for vertical movement on said frame assembly, said key plate being engageable with said rod connector for moving said rod connector and said rod in said one vertical direction and to a latch releasing position in response to angular movement of said outside latch operator and independent of the movement of said actuating means, and a key center operably engaged with said key plate and said outside operator and journalled on said frame assembly for coaxial angular movement with said outside operator, and wherein said rod connector overlies an associated marginal portion of said key plate and said key center underlies another marginal portion of said key plate.

4,295,674
LATCH MECHANISM
John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.
Filed Oct. 1, 1979, Ser. No. 80,246
Int. Cl.³ E05C *3/14*
U.S. Cl. 292—190 **15 Claims**



1. A latch mechanism which comprises:
a housing;
a rotor assembly rotatably journaled within said housing and rotatable between fully locked and unlocked positions, said rotor assembly having an interior latching surface and an exterior surface;
a flag mounted in longitudinally slidable relation with said rotor assembly, said flag having an exterior portion and an interior end and slidable between recessed and extended positions wherein rotation of said flag is restricted to common rotation with said rotor assembly;
biasing means for normally biasing said flag to said extended position wherein said exterior portion extends out of said rotor assembly;
coupling means for coupling said flag to said housing to prevent rotatable movement of said flag and rotor assembly only when said rotor assembly is in said fully locked position and said exterior portion of said flag is not visible externally of said rotor assembly, said coupling means including a plunger slidably mounted within said housing substantially perpendicular to said flag and slidable between flag engaged and flag disengaged positions, biasing means for biasing said plunger to said flag engaged position and a single indention having a bottom and wall located on said flag for receiving said plunger only when said rotor is in said fully locked position and said exterior portion of said flag is not visible externally of said rotor assembly; and
disengaging means for disengaging said flag from said housing.

4,295,675
COVER FOR PORT LIGHT
Shale J. Niskin, 3415 Chase Ave., Miami Beach, Fla. 33140
Filed Feb. 26, 1980, Ser. No. 124,828
Int. Cl.³ E05C *17/54*
U.S. Cl. 292—256.6 **4 Claims**



1. A locking and sealing arrangement for a port light of a floating vessel, comprising:
said port light;
a cover member with an outwardly facing rim having formed thereon a pair of spaced-apart, peripheral grooves, a first groove and a second groove;
a cover mounting member adapted to be secured to said floating vessel in surrounding relationship to said port light;
said cover mounting member having an inwardly facing surface dimensioned and configured to substantially conform to the said outwardly facing rim of said cover member;
at least portions of said inwardly facing surface having dimensions larger than said port light to provide a ledge when said cover mounting member is secured to said floating vehicle;
said inwardly facing surface having a third groove formed therein, said third groove being aligned to be in opposed relationship to said first groove to form a channel when said cover mounting member is in abutting relationship to said ledge;
an access bore extending through said cover mounting member and connecting with said channel;
an elongated and pliable locking member being adapted to be threaded through said access bore into said channel, whereby said pliable member spans the juncture of said cover member and said cover mounting member; and
a resilient sealing gasket being mounted in said second groove, whereby said gasket forms a substantially watertight seal with said inwardly facing surface of said cover mounting member;
said cover mounting member being formed of a plastic;
said cover member being formed of a transparent plastic material;
said cover member having at least one handle mounted thereon for disengaging said cover member from said cover mounting member;
said locking member terminating at one end with an enlarged portion, said enlarged portion having dimensions greater than the cross-sectional dimensions of said access bore.

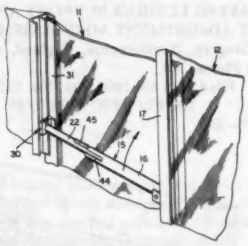
4,295,676
PATIO DOOR SECURITY LOCK
James A. Smith, 1314 Kingstown Pkwy., Smyrna, Ga. 30080
Filed Jan. 15, 1980, Ser. No. 112,216
Int. Cl.³ E05C *17/30*
U.S. Cl. 292—262 **11 Claims**

1. Locking apparatus for use with a pair of panels at least one of which is mounted for sliding movement between an open

position and a closed position in parallel relation to the other panel, said locking apparatus comprising:

a first member disposed to be stationary with respect to said sliding panel;

a second member selectably connectable to the sliding panel and being selectably extensible with respect to said first member to occupy at least two positions relative to said first member;



said second member when in one such position cooperating with said first member to maintain said sliding panel at a closed position; and

said second member when in another such position cooperating with said first member to permit said sliding panel to occupy a partially open position, and operatively associated with said sliding panel to prevent disconnection of said second member from said partially open sliding panel.

4,295,677

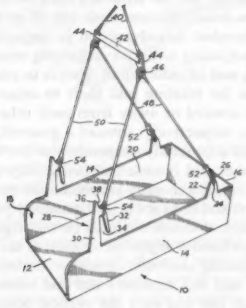
SELF-DUMPING HOISTING BUCKET ASSEMBLY

Jerome A. Petrin, 9105 SW. Mt. View La., Tigard, Oreg. 97223

Filed Nov. 14, 1979, Ser. No. 94,046

Int. Cl.³ E04G *21/02*

U.S. Cl. 294—73 **4 Claims**



1. A self dumping hoisting bucket assembly of the class releasable for dumping upon slackening a flexible hoisting suspension by which it is supported, the bucket assembly comprising:

(a) a box comprising a bottom, two upstanding side walls, an upstanding rear wall and a front end providing a discharge chute which is substantially open the width and depth of the front of the box and configured to receive a dump truck for loading the bucket;

(b) a pair of downwardly opening hooks adjacent the front of the box and substantially exterior of the space vertically above the interior of the box, one being attached to one side wall and the other being attached to the other side wall, each hook comprising an upright shank segment attached at its base to the front portion of one of the side walls, and a retainer segment attached to the top of the shank segment and arranged reversely to form a recess between the shank segment and the retainer segment; and

(c) a hoisting suspension for the box comprising

(1) a cross beam substantially as long as the box is wide and suspendable horizontally by a hoist above the box,

(2) at least one flexible rearward suspensory member connecting the rear of the box to the cross beam,

(3) a pair of flexible forward suspensory members connecting the front of the box to the cross beam, each including a coupler configured and dimensioned for releasable engagement with one of the hooks, and each being attached to the cross beam at a location such that it lies substantially exterior of the space vertically above the box, each hook having a coupler guard segment extending outwardly from the top of the shank and arranged upon slackening of the suspension to be engaged by the coupler to effect disengagement of the coupler from the hook.

4,295,678

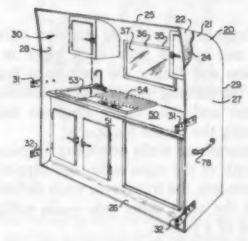
VAN MODIFIERS

Robert L. Morris, c/o Morr-Van Products, 322 Division La., Beaver, Pa. 15009

Filed Sep. 12, 1978, Ser. No. 941,477

Int. Cl.³ B60P *3/34*

U.S. Cl. 296—156 **5 Claims**



1. An apparatus for rearwardly extending a van body having a rear door opening with vertically spaced apart rear door hinge mountings at each side of the opening comprising an integral hollow generally quadrangular module having a continuous outer shell free from supporting structural framework attached to the vehicle and having a top, spaced side walls, a bottom and a back wall and an inner shell laminated to and supporting said outer skin over at least a major portion of the total area of each of said top, side walls, bottom and back to form a unitary self-supporting structure, said module including spaced apart roof and bottom members connected by a back wall and two side walls, a front wall opening corresponding to width of the rear door opening in the van and defined by said roof, bottom and side walls and vertically spaced fastening means on said module on each side thereof entering said rear door opening and replacing said hinges in said rear door opening for fastening said module therein.

4,295,679

VAN STRUCTURE

Wolfgang Artweger, Windischgarsten, and Walter Freller, Sierning, both of Austria, assignors to "Wohn-Art" Freizeitartikel Gesellschaft m.b.H., Windischgarsten, Austria

Filed Jul. 17, 1979, Ser. No. 58,184

Claims priority, application Austria, Jul. 20, 1978, 5293/78

Int. Cl.³ E04B *1/346*

U.S. Cl. 296—171 **24 Claims**

1. A van structure comprising

(a) a box-like main cabin having a floor, two side walls and a roof, the opposite ends of the main cabin being open,

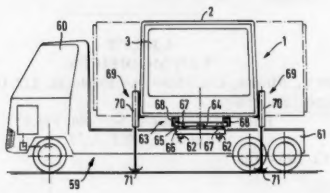
(b) two box-like extension cabins each having a floor, two

side walls, a roof and an end wall interconnecting the side walls, an open end of each extension cabin opposite the end wall thereof being received in a respective one of the open ends of the main cabin,

(c) longitudinally extending guide means slidingly guiding the extension cabins for sliding movement relative to the main cabin and to each other whereby the extension cabins may be telescopingly moved into and out of the main cabin,

(d) means for moving the extension cabins out of the main cabin under a tensile force, and

(e) a utility unit in the main cabin centered between the opposite ends thereof and constituting a vertically extending separation substantially parallel to the opposite open ends and dividing the main cabin into two compartments, the utility unit including



(1) two load-bearing carrier elements affixed to the main cabin and spaced from each other in a longitudinal direction and facing the two open ends of the main cabin, the moving means being anchored to the carrier elements and the carrier elements being capable of sustaining the tensile force,

(2) two transverse walls extending perpendicularly to the side walls of the main cabin and supported by the carrier elements, the transverse walls defining a space with one of the main cabin side walls sufficient to permit passage of a person,

(3) a wash room facility arranged between the transverse walls,

(4) a kitchen facility and

(5) a storage facility, the transverse walls constituting rear walls for the kitchen and storage facilities, respectively, the kitchen and storage facilities facing the respective open ends of the main cabin.

4,295,680

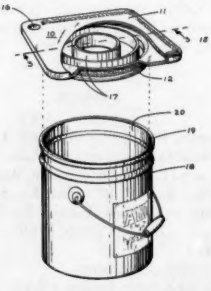
UTILITY BUCKET SEAT

Michael Grasso, 24 Laurie Rd., Brentwood, N.Y. 11717

Filed Nov. 7, 1979, Ser. No. 92,109

Int. Cl.[3] **A47C** *31/00;* **B63C** *9/08*

U.S. Cl. 297—193 **1 Claim**



1. A seat used in association with a pail for sitting, for use as a buoy, for use as a table top and for use as a cover, which comprises:

(a) a top seat section for sitting;

(b) a weight bearing flange for resting on the open end of a pail;

(c) a buoyant internal section so that the seat will float; and

(d) means to attach and store a rope to said seat.

4,295,681

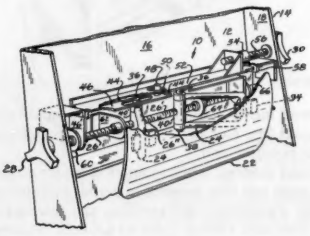
SEAT HAVING LUMBAR SUPPORT AND VERTICAL HEIGHT ADJUSTMENT MECHANISM THEREFOR

Leslie A. Gregory, Northampton, England, assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 19, 1980, Ser. No. 122,152

Int. Cl.[3] **A47C** *3/00, 7/46*

U.S. Cl. 297—284 **8 Claims**



1. A seat backrest comprising a rigid back portion and a resilient upholstered cushion member attached to said back portion, a generally horizontal lumbar pad having an elongated, convex-shaped forward surface located between said back portion and said cushion, said pad being pivotally mounted to one end of a pair of spaced link members; each of said link members being supported at its other end for pivotal movement about trunnions located on each of a pair of threaded adjusting nuts; an adjusting shaft having a left handed thread portion in engagement with one of said adjusting nuts and a right handed thread portion in engagement with the other of said adjusting nuts; spaced bearing means for rotationally mounting said adjusting shaft relative to said backrest; first control means for rotating said shaft to cause said adjusting nuts to move toward or away from each other to cause said links to move, respectively, toward a generally parallel position or toward a generally perpendicular position relative to said lumbar pad, said lumbar pad being fully extended when said links are in said generally perpendicular position and fully retracted when said links are in said generally parallel position, and second control means mounted on said rigid back portion for producing a limited degree of rotation of said adjusting nuts about said adjusting shaft and causing a corresponding pivotal movement of said link members and said lumbar pad so as to tilt said lumbar pad and vary the vertical position of the forwardmost portion of its convex-shaped forward surface relative to the back portion.

4,295,682

SUPERFINE TOOTH SEAT BACK ADJUSTER

Bernd A. Kluting, Radevormwald, Fed. Rep. of Germany, and Vikram H. Zaverni, Springfield, Mich., assignors to Keiper U.S.A., Inc., Battle Creek, Mich.

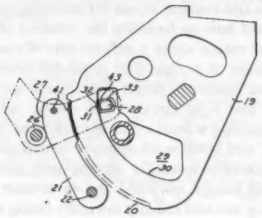
Filed Nov. 1, 1979, Ser. No. 90,343

Int. Cl.[3] **A47C** *1/026*

U.S. Cl. 297—367 **25 Claims**

1. A hinge fitting for vehicle seats having a tiltable backrest member comprising a first hinge member connectable to a seat rest member, a second hinge member connectable to a backrest member, pivot means connecting said hinge members for relative pivoting movement, an adjustment quadrant for regulating

the operative position of said second hinge member relative to said first having a toothed sector centered on said pivot means provided with fine pitch teeth, toothed pawl means and integral dual side tension linkage mounted on said first hinge member on either side of said pawl and toothed sector and in relatively movalbe compressively clamping and release relationship with said pawl and toothed sector, and manual means for effecting said clamping and release relationships.

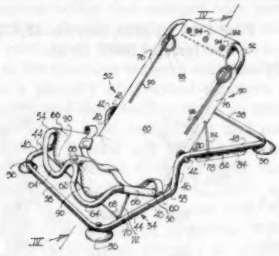


4,295,683

ORTHOPEDIC CHAIR

David T. Dubbink, 1339 N. Sultana, Ontario, Calif. 91764, and Lynda L. Vogler, 8855 Mustang Ave., Alta Loma, Calif. 91701

Filed Jul. 11, 1979, Ser. No. 56,532
Int. Cl.³ A47C *5/06*
U.S. Cl. 297—377 **2 Claims**



1. An orthopedic chair particularly adapted for bathing handicapped persons comprising:

(a) a frame assembly having a pair of spaced side members, a bottom member connected between said side members on one of the ends of said side members, and a top member connected in parallel to said bottom member between said side members on the ends thereof opposite said bottom member, said frame assembly further including support means for supporting said frame assembly and for maintaining the top and bottom members horizontal with said top member above said bottom member when said frame assembly is placed on a substantially horizontal surface, said bottom member further being in the shape of two upward facing U-shaped sections; and,

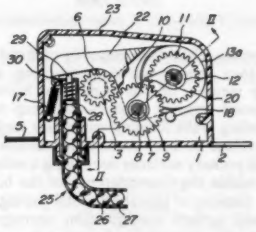
(b) a body portion of flexible sheeting connected to said frame assembly between said bottom member and said side members to a point close adjacent the top member to form a sling chair wherein the person can sit supported from a point about the knees up to and including the person's head, said body portion including means for selectively releasing only a portion of said connection of said body portion between said side members adjacent the top portion sufficient to not support the person's head and provide access for washing the back of the person's head and hair while continuing to support the remainder of the person's torso, said releasing means comprising a pair of zippers extending from an edge of said body portion adjacent said top member toward said bottom member and disposed to have respective ones of said zippers on opposite sides of the head of the person in the seat, said body portion further being attached to said bottom member so as to form a U-shaped sling in each of said U-shaped sections whereby the legs of the person when placed in respective ones of said slings are supported and separated.

4,295,684

SAFETY BELT WIND-UP DEVICE

Katsumi Naitoh, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Nov. 14, 1979, Ser. No. 94,200
Claims priority, application Japan, Jan. 19, 1979, 54-3874
Int. Cl.³ A62B *35/00*; B65H *75/48*
U.S. Cl. 297—475 **8 Claims**

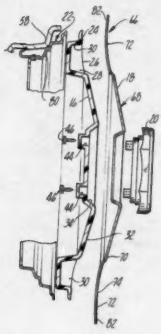


1. A safety belt wind-up device including an engageable and disengageable buckle, comprising: a rotatable webbing wind-up shaft driven in a direction for winding up a webbing of the device, wind-up force lock means capable of assuming interlocked and uninterlocked positions with said wind-up shaft, said lock means in said interlocked position preventing a drawn webbing from being further wound up but providing for said webbing to be drawn and wound up within a predetermined length of said drawn webbing, and means for bringing said lock means into said interlocked and uninterlocked positions, respectively, depending upon engagement and disengagement of the buckle of said device, said wind-up force lock means comprising (1) a first member engaged with and being rotatively driven by said wind-up shaft while said wind-up force lock means are in said interlocked position, (2) a first cam rotating together with said first member, (3) a second member engaged with and being rotatively driven by said first member, and (4) a second cam rotating together with said second member, said first and second cams being substantially in a first engagement position when said wind-up force lock means are brought into said interlocked position and said first and second cams being substantially in a second engagement position when said wind-up force lock means are in said interlocked position and said webbing has been drawn said predetermined length out of the device, whereby in the first engagement position even if said first member is rotatively driven by said wind-up shaft in a webbing wind-up direction so as to be rotated together with said first cam, the rotation of said first member is prevented by the first and second cams in the first engagement position, and in the second engagement position even if said first member is rotatively driven by said wind-up shaft in a webbing drawing out direction so as to be rotated together with said first cam, the rotation of said first member is prevented by the first and second cams in the second engagement position.

4,295,685
PLASTIC AND METAL WHEEL TRIM ASSEMBLY

Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185

Continuation of Ser. No. 856,309, Dec. 1, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,938
Int. Cl.[3] B60B 7/00
U.S. Cl. 301—37 P 4 Claims

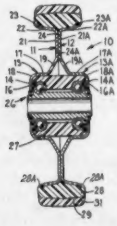


1. A composite wheel trim assembly of metal and plastic for attachment to a vehicle wheel, comprising: a unitary disc-shaped body member of plastic material having axially outwardly disposed primary surfaces and deep recesses having axially extending walls forming secondary surfaces extending from adjacent said primary surfaces for reinforcing said body member, said primary surfaces occupying a substantial portion of the area within the circumference of the body member, a metal cover member of thin sheet metal having an outline and axially inward surface configuration corresponding to the shape of said primary surfaces, fastening means coacting with said metal cover member and an inboard surface portion of said plastic body member to hold said cover member to said primary surface to reinforce said body member and provide a decorative metal layer having substantially all of its said inner surface in contacting relationship with all of said primary surface area and leaving said secondary surfaces exposed, and a retainer assembly attached to said body member for attachment to a vehicle wheel.

4,295,686
DISK WHEEL WITH RESILIENT BEARING SUPPORT AND RIGID ANNULAR TREAD MOUNTING SURFACE

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Continuation of Ser. No. 964,130, Nov. 27, 1978, abandoned. This application May 5, 1980, Ser. No. 146,895
Int. Cl.[3] B60B 1/06; F16C 33/00
U.S. Cl. 301—63 DD 5 Claims



1. A wheel construction, comprising:

rigid circular disk means having means thereon defining a hole in approximately the center thereof, said disk means having a radially outwardly facing surface thereon, a pair of laterally spaced axially outwardly facing surfaces contiguous with said radially outwardly facing surface and at least a pair of laterally spaced, radially inwardly facing surfaces on opposite axial sides thereof each contiguous with an axially facing surface;

bearing means and resilient means for mounting said bearing means in said hole to facilitate the rotation of said rigid circular disk means about a defined axis of rotation;

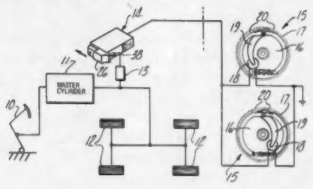
an annulus made of a rigid first moldable synthetic resin material and securing means for fixedly securing said annulus to said rigid circular disk means, said securing means comprising at least a pair of integral portions of the material of said annulus on opposite lateral sides thereof extending radially inwardly around said axially facing surfaces and axially inwardly and in contact with said axially facing and said radially inwardly facing surfaces on said disk means, said annulus having no fusion bonding affinity to the material of said disk means, said annulus also having a peripheral surface thereon defining a tread mounting surface; and

an annular tread made of a second moldable synthetic resin material in close and intimate contact with said peripheral surface on said annulus and fusion bonding said tread and said annulus together thereby to firmly and securely lock said tread to said annulus.

4,295,687
ELECTRIC BRAKE SYSTEM

James Becker, Ann Arbor, and Daniel L. Neill, Belleville, both of Mich., assignors to Kelsey Hayes Company, Romulus, Mich.

Filed Feb. 26, 1979, Ser. No. 15,572
Int. Cl.[3] B60T 13/68
U.S. Cl. 303—20 7 Claims

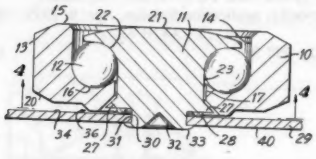


1. A braking system for controlling electrically operated brakes for a driver controlled vehicle comprising braking means electrically energizable for applying a braking force to the brakes, an electric energy source, control means selectively adjustable by the driver in accordance with a desired braking force, said control means developing a control signal only after a predetermined initial adjustment that varies rapidly from a threshold magnitude to a certain magnitude and thereafter varies linearly with a further adjustment thereof, controller means operative to couple said braking means to said source in response to such control signal, said controller means developing a pulsating output for energizing said brake means having a predetermined frequency and having a pulse width determined by the magnitude of such control signal, and excessive current protection means operative in response to a predetermined high current level in such controller means output for inhibiting such controller means output for a predetermined limited period of time including an AND gate having a plurality of inputs and an output, means supplying the pulsating output to one of said gate inputs, means connecting said gate output to energize said brake means, and means connected to another of said gate inputs for blocking said gate output for such predetermined limited time period in response to such predetermined high current level in the controller output.

4,295,688
BEARING CONSTRUCTION

William Blasnik, Demarest, N.J., assignor to Hardware Designers, Inc., Mt. Kisco, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,094
Int. Cl.³ F16C *19/16, 29/04, 35/06*
U.S. Cl. 308—3.8 5 Claims



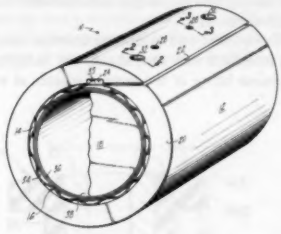
1. A bearing device for supporting drawers or the like for translatory movement, said device comprising a generally disk-shaped polymeric tire member including a circular peripheral surface defining a runner, an enlarged bore portion extending axially from one end face of said tire member and terminating in an outer bearing race directed toward said one end face, a reduced bore portion extending from the other end face of said tire member and merging with said outer race at the radial innermost end of said race, an annular recess formed on the outer face of said other end of said tire member and forming a radial outward extension of said reduced bore portion, a metallic stud member forming a fixed component of said bearing member, said stud member including an enlarged head portion at one end disposed within said enlarged bore portion and a generally cylindrical shank extending outwardly through said reduced bore portion, an inner bearing race formed on said stud member at the transition between said head portion and shank portion, a plurality of spherical members interposed between said outer and inner bearing races, an annular collar member formed at the other end of said stud member and projecting outwardly beyond said reduced diameter bore, a plurality of tab portions struck from said collar member, said tab portions being disposed within said recess at positions axially outwardly of said reduced diameter bore whereby the axially outwardly directed face of said collar member, after formation of said tab portions, presents an axially directed, discontinuous crown configuration, the axial terminal portions of said crown configuration lying in a plane axially beyond all portions of said other face of said tire member, said stud member including, in addition, a cylindrical deformable attachment member extending axially beyond said plane of said crown configuration whereby said bearing member may be mounted within an aperture in a bracket with said crown configuration engaging one face of said bracket and turned-over increments of said attachment member engaging the opposite face of said bracket.

4,295,689
ADJUSTABLE CLEARANCE FOIL JOURNAL BEARING AND METHOD OF MANUFACTURING FOIL ELEMENT THEREFOR

Lazar Licht, San Mateo, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 30, 1979, Ser. No. 71,508
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 13 Claims

1. A hydrodynamic foil journal bearing comprising
a stationary retaining member having a bore and a slit communicating with said bore;
a resilient foil insert assembly mounted on said retaining member in said bore and having a first bearing surface;
a rotatable journal disposed within said bore and having a second bearing surface cooperative with said first bearing surface to induce a fluid film therebetween; and

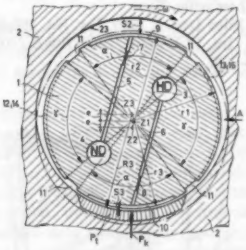


means on said retaining member associated with said slit for varying the size of said bore to provide desired clearance and loading in said journal bearing.

4,295,690
HYDROSTATIC BEARING FOR A RADIAL PISTON MACHINE

Peter Rutz, Brunnelihohestrasse 2, CH-8400 Winterthur, Switzerland

Filed Jan. 29, 1980, Ser. No. 116,492
Claims priority, application Switzerland, Mar. 1, 1979, 2029/79
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 7 Claims



1. A hydrostatic bearing for a radial piston machine, said bearing comprising
a stationary cylindrical pintle having at least one bore therein for conducting a flow of high pressure medium, a hydrostatic bearing pocket in one surface thereof and a throttle communicating said bore with said bearing pocket to deliver a throttled flow of pressure medium thereto, said surface having a radius larger than the adjacent surfaces on either side of said bearing pocket; and
a member rotatably mounted on said pintle, said member having a circular cylindrical bore of a radius approximately equal to said radius of said one surface.

4,295,691
MOUNTING GROMMET

Randall J. Rubenthaler, Lincoln, Nebr., assignor to Caterpillar Tractor Co., Peoria, Ill.

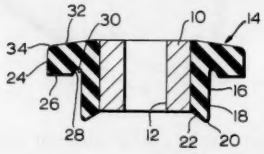
Continuation of Ser. No. 742,145, Nov. 15, 1976, abandoned.
This application Feb. 15, 1978, Ser. No. 878,009
Int. Cl.³ F16C *27/00*
U.S. Cl. 308—238 2 Claims

1. A mounting grommet comprising:
a sleeve of hard material;
a tubular, elastomeric element extending about and along the

length of said sleeve, said element having a length greater than that of said sleeve and including

a cylindrical shank having an enlarged head at one end, said head having an axial length considerably shorter than that of said element;

an axially opening and extending annular recess in said head at its interface with said shank, the radially inner wall of said recess being of the same diameter as said shank,



said head having a generally frusto-conical surface on its side opposite said recess, the radially outer portion of said frusto-conical surface being located intermediate the ends of said elastomeric element; and

means for axially compressing said element to a length about equal to that of said sleeve;

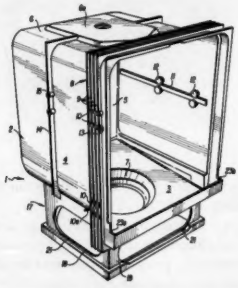
whereby said recess will deflect radially inwardly to a location partly in said head and partly in said shank.

4,295,692

DISHWASHER TUB ASSEMBLY

Thomas E. Jenkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 5, 1979, Ser. No. 100,682
Int. Cl.³ A47B 77/06; B08B 3/00
U.S. Cl. 312—228 **12 Claims**



10. A dishwasher tub assembly comprising a plastic open front tub having a generally rectangular cross-section;

a plastic supporting rib frame comprising a plurality of ribs extending parallel to and spaced equidistantly from each other formed on the external periphery of said tub adjacent the front opening thereof;

a plurality of plastic cross-ribs formed on the external periphery of said tub and intersecting said rib frame at an angle thereto;

plastic support ribs formed on the external periphery of each side of said tub spaced apart from said rib frame;

a plastic base mounted on the bottom of said tub comprising a generally hollow box-like structure with horizontal dimensions approximating those of the lower wall of said tub, and having an open bottom generally rectangular cut-outs in the front and two side sections, and a generally semielliptical cut-out in the rear section; and

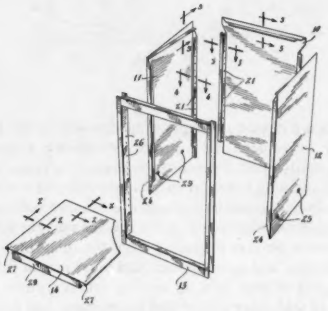
said plastic tub, rib frame, cross-ribs, support ribs, and base comprising a single unit of homogeneous one-piece construction.

4,295,693

KNOCKED-DOWN CABINET

Ake E. Viklund, Säffle, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Nov. 14, 1979, Ser. No. 94,181
Claims priority, application Sweden, Apr. 9, 1979, 7903119
Int. Cl.³ A47B 43/00
U.S. Cl. 312—257 R **5 Claims**



1. A cabinet which is assembled without the use of fastening means and having a rear wall, two side walls, and a frame-shaped front wall which are all interconnected to form a box-like structure, the adjacent edges of said rear and side walls having bent portions which upon abutment and pivoting hook one another to form a joint which prevents separation of said side walls and rear wall wherein said adjacent edges of said rear wall and side walls are bent to extend generally vertically to said rear wall and abut each other, aligned apertures in each of said generally vertical edges, and shelf supports having means for insertion through said apertures in order to lock said rear and side walls together, said rear wall having an edge which is generally bent at right angles to the plane of said rear wall and which projects into the interior of the cabinet, an outer portion of said edge having a reverse bend, said adjacent side walls having a bent edge which is inserted in a groove formed between said outer portion of the edge of said rear wall and the reverse bend portion, and a portion intermediate said bent edge and said side wall which forms an extension to said rear wall and is coextending therewith to form an outer even surface of the rear wall of said cabinet, and a top part having opposite edge portions that are bent at an angle to said top part and are adapted to slide over adjacent edges of said side walls and interconnect with said frame-shaped front wall, and rear and side walls.

4,295,694

INTERCEPTOR PLUG

Robert E. Manning, 310 Siesta Ave., Thousand Oaks, Calif. 91360

Filed Jun. 21, 1979, Ser. No. 50,709
Int. Cl.³ H01R 15/00
U.S. Cl. 339—8 P **1 Claim**

1. An interceptor plug for intercepting an phone signal available at a standard electrical jack comprising:

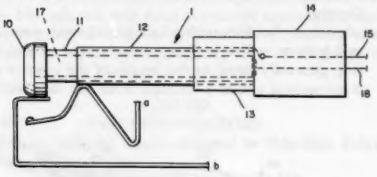
(A) a central shaft of electrically conductive material having an integral interior tip, said tip being eccentric relative to said central shaft;

(B) an electrically insulating sleeve concentric and coextensive with said central shaft except for said tip;

(C) an electrically conductive sleeve concentric and coestensive with and exterior to said insulating sleeve except

that the length of said conductive sleeve is adjusted to expose said insulating sleeve at said interior tip end;

(D) a positioning sleeve of electrically insulating material surrounding the combination of said central shaft, insulating sleeve and conductive sleeve so as to insulate said conductive sleeve from the body of said jack;



(E) a grip of nonconductive material firmly affixed to said positioning sleeve, said grip surrounding two conductive wires running lengthwise through said grip and extending beyond the ends of said grip; and,

(F) a connection means for connecting one of said wires to said exterior end of said central shaft and the other of said wires to said exterior end of said conductive sleeve.

4,295,695

ELECTRICAL CONNECTORS

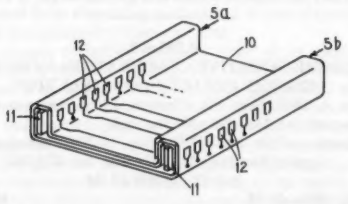
Robert J. Dodds, Crewe, England, assignor to International Computers Limited, London, England

Filed Oct. 5, 1979, Ser. No. 82,095

Claims priority, application United Kingdom, Oct. 12, 1978, 40355/78; Oct. 21, 1978, 41471/78

Int. Cl.³ H01R *1/11*

U.S. Cl. 339—17 F **9 Claims**



1. An electrical connector cable assembly having an integrally formed edge connector element at each end thereof for electrically interconnecting first and second edge type connector units each having first and second contact arrays located on opposite sides of a connector unit receiving region so that the first contact arrays of the first and second connector units are interconnected and the second contact arrays of the first and second connector units are interconnected, the assembly comprising;

two elongate connector element stiffening members each providing first and second surfaces separated by a predetermined distance; a length of electrically non-conductive substrate folded about the two stiffening members so that the first and second surfaces of the stiffening members are covered by the substrate material and are interconnected by at least three side-by-side layers of the substrate;

the substrate having on a first surface thereof two groups of contact areas each including first and second arrays of electrical contact areas, extending across the width of the substrate, the arrays being so located on the substrate first surface that when the substrate is folded about the stiffening members a said first contact array coincides with each of the stiffening member first surfaces and a said second contact array coincides with each of the stiffening member second surface;

a first electrical conductor system provided on the substrate first surface interconnecting the first arrays of the first and second groups and a second electrical conductor system provided on the substrate first surface interconnecting the second arrays of the first and second groups.

4,295,696

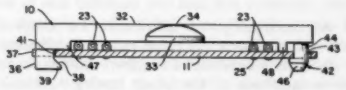
STRAIN RELIEF FOR CONNECTOR WIRES

Vincent F. Gray, Oklahoma City, Okla., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,241

Int. Cl.³ H01R *13/58*

U.S. Cl. 339—17 C **1 Claim**



1. A connector and strain relief assembly, which comprises:

a flat circuit board for mounting the connector, said board having an array of terminals interconnected to said connector;

a cable comprising a jacket and a plurality of insulated wires, the ends of which extend beyond the end of the jacket and are fanned across the board and solder secured to the terminals;

a T-shaped strain relief having a crossarm overlaying the wires and a stem with a knob formed thereon and positioned beneath an end section of said cable jacket, the crossarm of said strain relief being provided at one end section thereof with a projecting member that is undercut along one edge to form a nub, said undercut extending as a bevel surface to a straight line post section which is approximately equal in length to the thickness of the board, and the other end section of the crossarm being provided with a projecting cylindrical boss having a frusto-conical head, the central axes of the boss and the head being offset with respect to each other so that a lobe portion of the head overhangs the boss;

said board having a slot formed across one edge to receive the projecting member with the nub thereof underlying the circuit board, and said board having a hole formed therein to receive the projecting boss with the lobe portion underlying the circuit board, said hole and cylindrical boss being so positioned that the lobe deflects the boss when the strain relief is pressed to move and snap the lobe through the hole into the circuit board underlying position, said movement of the frusto-conical head through the hole acting to move, the bevel surface of the projecting member along the bottom edge of the slot to seat the straight line post section, against the bottom of the slot, and

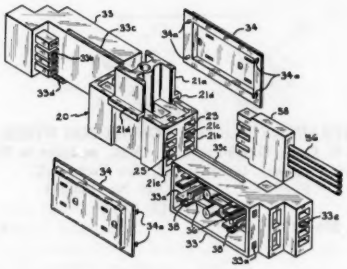
means projecting from the crossarm to limit the movement of the crossarm toward the circuit board and thus limit the strain relief force applied to the array of wires by the assembled circuit board and strain relief while holding both the overhanging lobe portion of the frusto-conical head and the juncture of bevel surface with the post in close proximity to the underside of the board.

4,295,697

ELECTRICAL POWER DISTRIBUTION SYSTEM PRINCIPALLY FOR SPACE-DIVIDING PANELS IN OFFICE BUILDINGS

Paul R. Grime, Erie, Mich., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 31, 1980, Ser. No. 117,405
Int. Cl.³ H02G *3/28*
U.S. Cl. 339—22 R **5 Claims**



1. An electrical power distribution kit comprising an elongated molded plastic electrical power distribution block having electrically conductive members molded therein, the conductive members of the block having terminals accessible respectively from opposite ends of the block, and an elongated molded plastic slide-in duplex receptacle having electrically conductive members molded therein, each of the block and receptacle members having aligning and interlocking means thereon cooperable with aligning and interlocking means on the other, the receptacle being fastenable to the block by sliding the receptacle in the direction of its length along one side of the block in the direction of the length of the block and thereby engaging the cooperable aligning and interlocking means with each other, the receptacle being engaged with a portion of one end of the block and with the one side of the block when fastened thereto, the conductive members of the receptacle having terminals cooperatively engageable respectively with terminals of the conductive members of the block adjacent the one end thereof as the receptacle is fastened to the block by engagement of the cooperable aligning and interlocking means with each other, the terminals of the conductive members of the block being recessed within the block respectively in recesses therein, the terminals of the conductive members of the receptacle respectively being shielded by plastic sleeve portions of the receptacle, the plastic sleeve portions being receivable respectively in recesses of the block as the terminals of the conductive members of the receptacle are cooperatively engaged respectively with terminals of conductive members of the block, the conductive members of the receptacle also having two sets of socket terminals accessible from a front face of the receptacle parallel to the sides of the block when the receptacle and block are assembled, the two sets of socket terminals being spaced longitudinally of the receptacle, and the cooperable aligning and interlocking means being an aligning means when the receptacle is being fastened to the block and an interlocking means when a service cord is being pulled out of one of said sets of socket terminals.

4,295,698

ELECTRICAL CONNECTOR HOUSING

Weichien Chow, Park Forest, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

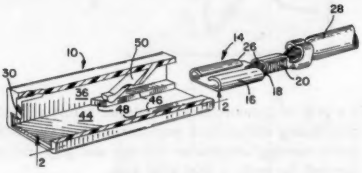
Continuation of Ser. No. 949,843, Oct. 10, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 106,228
Int. Cl.³ H01R *13/42*
U.S. Cl. 339—59 R **6 Claims**

1. An electrical connector housing for retaining an electrical contact having a forward engagement section, a rearward termination section and contact shoulders disposed between the engagement and termination sections, the housing comprising:

a dielectric body having a passageway for receiving a contact, said passageway being defined by a bottom wall, a top wall and two side walls;

a forward stop positioned at the mating end of said passageway to limit forward movement of a contact inserted therein;

an abutment shoulder within said passageway positioned on said bottom wall at a distance to the rear of said forward stop generally equal to the length of the contact engagement section and at a distance from one side wall generally less than the width of the contact engagement section and greater than the width of the contact termination section, said abutment shoulder limiting rearward movement of the contact; and



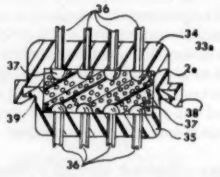
flexible latching means deflected by the contact engagement section during insertion of the contact into said passageway, for engaging the contact without interference from the contact termination section, said latching means biasing the engagement section against said bottom wall within the space defined by said forward stop and said abutment shoulder, said latching means further co-operating with said abutment shoulder and said forward stop to retain the contact within said passageway.

4,295,699

PRESSURE SENSITIVE COMBINATION SWITCH AND CIRCUIT BREAKER CONSTRUCTION

Gideon A. DuRocher, Mt. Clemens, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 857,941, Sep. 15, 1969, abandoned. This application May 22, 1974, Ser. No. 472,582
Int. Cl.³ H01R *13/24*
U.S. Cl. 339—61 M **19 Claims**



1. In an electrical system comprising first and second electrical devices, each of said first and second electrical devices having a plurality of spaced apart contacts, at least one of said plurality of contacts comprising raised land portions, a one piece sheet connector having elastomericlike properties positioned between the devices and overlapping superimposed contacts of said first and second devices, means to compress the sheet connector between superimposed contacts of said first and second devices on opposite surfaces of said sheet connector, said sheet connector having a low resistance through the volume between superimposed contacts where compressed and a high resistance where not directly com-

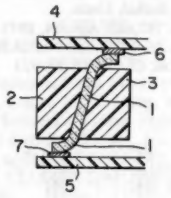
pressed between said superimposed contacts so that each pair of superimposed contacts are electrically isolated from every other pair of superimposed contacts, said sheet connector of a thickness X and has the property that when adjacent contacts on opposite sides of said sheet are positioned as close as the distance X apart and compression is applied by pressing superimposed contacts on opposite sides of the sheet together, the resistance through the sheet between superimposed contacts is low relative to the resistance between adjacent contacts, where X is 5 to 100 mils and said sheet connector comprises a homogeneous mixture of electrically conductive particles and a nonconductive binder material having elastomeric properties.

4,295,700

INTERCONNECTORS

Ryoichi Sado, Saitama, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1979, Ser. No. 82,719
Claims priority, application Japan, Oct. 12, 1978, 53-140085
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—61 M **2 Claims**



1. An interconnector comprising

(a) a rectangular connecting piece of a film or sheet made of an elastic material having anisotropical electro-conductivity in the direction parallel to one edge line thereof, and formed from alternating sandwiched stripes of conductive and nonconductive elastomer, and

(b) a couple of holder members made of an electrically insulating material holding said rectangular connecting piece of an elastic material having anisotropical electroconductivity as sandwiched therebetween in such a manner that the two opposite peripheral portions of said rectangular connecting piece at the edge lines perpendicular to the direction of the anisotropical electroconductivity are each extended out of the surfaces of the holder members in the direction forming an angle between 10° and 80° with said surface of the holder member by a height at least equal to the thickness of said rectangular connecting piece.

4,295,701

ELECTRICAL CONNECTOR FOR SUBMARINE REPEATERS OR THE LIKE

Duncan A. Gunn, Saffron Walden, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 71,876
Claims priority, application United Kingdom, Sep. 7, 1978, 35914/78
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—94 A **4 Claims**

1. A detachable electrical connector assembly including a pair of mateable connector sub-assemblies providing an electrical connection between separated high and low fluid pressure environments, the combination comprising:

a bulkhead separating said high and low pressure fluid environments and having an aperture therethrough;

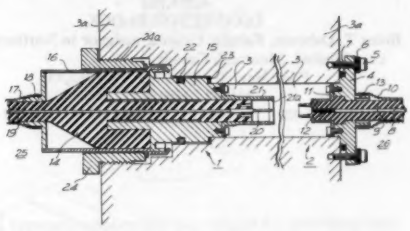
a first connector assembly;

first means for mounting said first connector sub-assembly partially through said bulkhead aperature and adjacent the low pressure side of said bulkhead, said first means including means providing a resilient compressive retaining force between a surface of the body of said first connector sub-assembly and the surface of said bulkhead low pressure side when said sub-assemblies are not mated;

second means including a first seal compressed between said first connector sub-assembly body surface and said bulkhead low pressure side in response to said retaining force,

an inert gas present against said low pressure side of said bulkhead;

a second connector assembly mateable from the high pressure side of said bulkhead into said first connector assembly, the dimensions of said bulkhead and said connectors being such that, upon mating of said connector assemblies said first connector overtravels against said resilient compressive retaining force to an extent permitting said inert gas to readily flow past said first seal into the volume surrounding the electrical connection between said connector assemblies, said first seal being restored by said resilient compressive force to retain said low pressure fluid when said second connector sub-assembly is withdrawn to break said electrical connection.

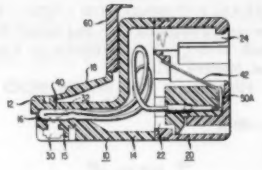


4,295,702

MULTI-OUTLET ADAPTER FOR PLUG-IN TELEPHONES

Dennis R. Snyder, Des Moines, Iowa, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 912,467, Jun. 5, 1978, abandoned, which is a continuation of Ser. No. 714,525, Aug. 16, 1976, Pat. No. T958,009. This application Dec. 21, 1979, Ser. No. 105,900
Int. Cl.³ H01R *13/514*
U.S. Cl. 339—97 P **7 Claims**



1. A multi-outlet adapter for plug-in telephones comprising:

a male member including a plug portion having a plurality of troughs respectively communicating with a like plurality of slots in the plug portion;

a plurality of conductors totally contained within the adapter, each conductor being doubled over within an individual trough in the plug portion and both ends of each conductor being terminated with a wire spring jack contact;

a plurality of blade-like plug contacts respectively positioned within the slots in the plug portion, each plug contact making electrical connection with the conductor positioned in the associated trough whereby the jack

contacts terminating the ends of the conductor are connected in parallel to the associated plug contact;

a pair of contact carriers, each contact carrier having one of the jack contacts mounted therein; and

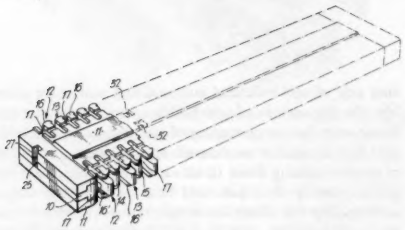
a female member joined to the male member, the female member having a pair of jack openings open to the outside of the adapter, the female member also having means for accommodating an individual carrier adjacent to each of the jack openings such that the jack contacts mounted in the carriers are exposed within the jack openings.

4,295,703

CONNECTOR BLOCK

Brian T. Osborne, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 27, 1978, Ser. No. 963,935
Int. Cl.³ H01R *13/38*
U.S. Cl. 339—98 **12 Claims**



1. An electrical connector block for interconnecting two pluralities of wires fanned along two opposite edges thereof comprising:

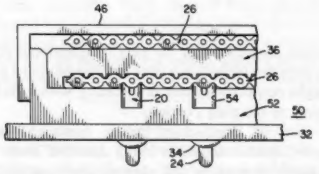
an elongate layered structure of three elements, a flat center element for supporting two staggered rows of flat, slotted, electrical connectors one on each surface thereof, and two insulating covers substantially coextensive, and compatible, with the center element, one on each side thereof and secured thereto, for positively retaining said connectors in place; said center element being an insulator having transversal slots in both of said opposite edges aligned with slots in said connectors for guiding and retaining wires to be inserted into the slots of said connectors for establishing electrical contact therewith.

4,295,704

SIDE PROBEABLE CONNECTOR USING FLAT CABLE

Ronald S. Narozny, Panorama City, and Robert P. Wyss, Manhattan Beach, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 3, 1979, Ser. No. 99,521
Int. Cl.³ H01R *13/50*
U.S. Cl. 339—99 R **18 Claims**



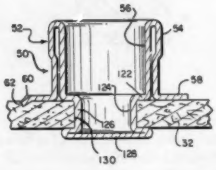
1. A side probeable electrical connector for terminating a multiconductor electrical cable comprising: a body portion having a first and a second surface in parallel spaced apart relationship and first and second walls spaced apart from each other and generally orthogonal with said first and second surfaces; said body portion defining at least two spaced bores from said first to said second surface; at least two electrical contacts, one such contact positioned in an associated bore and extending from said second surface to and beyond said first surface; a cover portion for locking engagement with said body portion and having a first surface and a second surface spaced apart from and generally parallel with said first surface of said cover portion; at least two annular recesses in said first surface of said cover portion for receipt respectively of a portion of said electrical contacts after same passes through an electrical cable placed between said first surfaces of said body portion and said cover portion; and at least one passage in said body portion having an axis transverse to the longitudinal axes of said bores and extending from one of said first and second walls to and communicating with said bores to permit said contacts to be probed by probe means inserted from outside of said body portion.

4,295,705

ONE PIECE CONNECTOR

Frank L. Ciliberti, Jr., Ossining, N.Y., assignor to Duracell International Inc., Bethel, Conn.

Division of Ser. No. 787,683, Apr. 14, 1977. This application Mar. 26, 1979, Ser. No. 24,122
Int. Cl.³ H01R *13/415*
U.S. Cl. 339—220 R **6 Claims**



1. A connector assembly comprising a one piece connector attached to a support; said connector having a connecting means with an integral bottom wall; said connecting means comprising a generally cylindrical outer wall, the diameter of said outer wall adjacent said support being less than the diameter thereof at a point nearer its opposite end, said outer wall being adapted to be received within and to make good contact with the inner wall of a mating connecting means; said bottom wall having an integral boss with a closed end protruding from said bottom wall in a direction away from said connecting means; an inner wall joining the top edge of the outer wall to the bottom wall; said support having an aperture therein through which the boss extends; the bottom end of said boss being pressed flat against and in intimate contact with the surface of said support remote from said connecting means in the form of an outwardly extending shoulder having a diameter greater than the diameter of said aperture; whereby said support is secured between the shoulder of said boss and said bottom wall in sealing relationship and whereby said one piece connector is securely attached to said support.

4,295,706

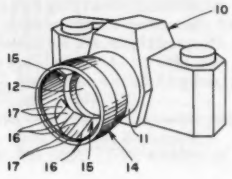
COMBINED LENS CAP AND SUNSHADE FOR A CAMERA

George H. Frost, 544 Ivan Dr., Kent, Ohio 44240

Filed Jul. 30, 1979, Ser. No. 61,840
Int. Cl.³ G02B *11/04*
U.S. Cl. 350—58 **11 Claims**

1. A compact and collapsible sunshade and lens cover for a camera having a tubular mount extending around and outwardly of the lens of the camera comprising ring means attachable to the tubular mount, sunshade means collapsible from a first position outward of the tubular mount to a second position

around the tubular mount to be compact therewith, lens cover means movable from a first position exposing the lens to a second position covering the lens as said sunshade means is being collapsed, means connecting said ring means to said



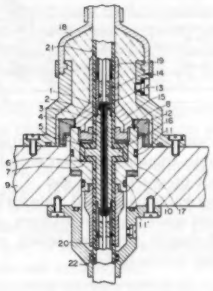
sunshade means to maintain said lens cover means in said first and second positions, and means connecting said ring means to said lens cover means to move said lens cover means from said first to said second position.

4,295,707

FEED THROUGH FOR OPTICAL SUBMERGED REPEATER

Taiichiro Nakai, Fujisawa; Kahei Furusawa, Kamifukuoka, and Yoshihiro Ejiri, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Oct. 3, 1979, Ser. No. 81,466
Claims priority, application Japan, Oct. 6, 1978, 53-122503
Int. Cl.[3] G02B *5/14;* H02G *3/00*
U.S. Cl. 350—96.20 **4 Claims**



1. In a feedthrough for an optical submerged repeater, which is disposed on an end face plate of the pressure resisting casing of the repeater for introducing an optical fiber and a power supplying feeder of an optical fiber submarine cable into a repeater circuit disposed in the pressure resisting casing of the repeater of an optical fiber submarine cable repeating system, the improvement comprising:

a metal coating deposited on the clad part of at least one optical fiber to be introduced through the feedthrough;

a metal pipe into which said optical fiber deposited with said metal coating is introduced for reinforcement and hermetically fixed therein;

a disc sleeve connected to the power supplying feeder of the optical fiber submarine cable at the outside and inside of the end face plate to form a part of the power supplying feeder and having at least one insertion hole for inserting and air-tightly fixing therein said metal pipe;

a metal body air-tightly fixed to said end face plate for housing therein said disc sleeve; and

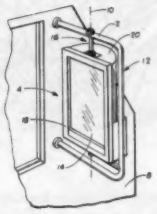
an insulator layer molded in a gap between said disc sleeve and said metal body and further molded together at at least the seawater side of said disc sleeve.

4,295,708

ELECTRO-MECHANICALLY ROTATABLE MIRROR

Robert D. Albrecht, Bethany; Michael Presley, Shawnee; William E. Waller, Ardmore; Gerald L. Cook, and William E. Presley, both of Stroud, all of Okla., assignors to Presley, Waller & Presley, Ardmore, Okla.

Filed Nov. 30, 1979, Ser. No. 98,754
Int. Cl.[3] G02B *7/18*
U.S. Cl. 350—289 **10 Claims**



1. An apparatus connectible to a vehicle for providing rearward vision to a driver of the vehicle at a plurality of selectable angles on either side of a neutral position, said apparatus comprising:

a support member connectible to said vehicle;

a rearview structure connected to said support member, said rearview structure including:

a housing;

a mirror;

means for rotatably connecting said mirror to said housing;

a motor having a drive shaft extending therefrom in acute angular relationship to said mirror;

means extending from said mirror for engaging said drive shaft in a fixed angular relationship;

means for maintaining said fixed angular relationship during periods of interaction between said motor drive shaft and said drive shaft engaging means;

means associated with said rearview structure operable by said driver for actuating said rotating means wherein said drive shaft includes a first segment secured to the rotor of said motor, a second segment having one end portion threadedly connected to said drive shaft engaging means in said fixed angular relationship, and said fixed angular relationship maintaining means includes a flexible sleeve element for pivotably coupling said first segment to said second segment so that said second segment pivots with respect to said first segment to maintain said fixed angular relationship during said interaction.

4,295,709

PARABOLIC REFLECTOR COMPRISING A PLURALITY OF TRIANGULAR REFLECTING MEMBERS FORMING A REFLECTING SURFACE SUPPORTED BY A FRAMEWORK HAVING A PARTICULAR GEOMETRIC PATTERN

Douglas E. Wood, Box 32, Fox Island, Wash. 98333

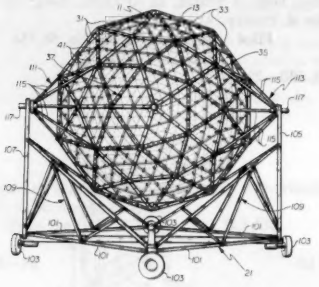
Filed Aug. 29, 1979, Ser. No. 70,914
Int. Cl.[3] G02B *5/10*
U.S. Cl. 350—292 **33 Claims**

1. A parabolic reflector apparatus, comprising:

(a) a rigid support matrix of substantially parabolic configuration, comprising a plurality of strut-like members jointed together in a geometric pattern which is substantially identical to the pattern of lines on a parabolic surface created by

projecting an icosahedron or a subdivided portion thereof onto the parabolic surface;

(b) a plurality of reflecting members;



(c) means on said support matric for supporting said reflecting members in such an arrangement that said reflecting members form a substantially parabolic reflecting surface.

4,295,710

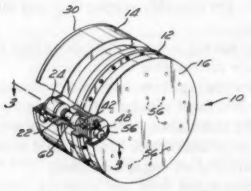
DEFORMABLE MIRROR WITH DITHER

Theodore A. Heinz, Simi Valley, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 4, 1979, Ser. No. 71,898

Int. Cl.³ G02B *7/18, 5/08*

U.S. Cl. 350—310 **9 Claims**



1. A deformable mirror for correcting wavefront aberrations in a laser fusion optical system, which comprises:

support means;

at least one ball screw mirror actuator interconnected with said support means;

a faceplate, which comprises:

a reflecting surface for reflecting a signal; and

a flex strut mounted at one end to said reflecting surface and at the other end to said ball screw mirror actuator; and

a dither actuator connected in series with said ball screw mirror actuator for either tagging or for real time dynamic correction.

4,295,711

LIQUID CRYSTAL DISPLAY DEVICE

Hironari Tanaka; Shigeru Matsuyama; Tadashi Ishibashi; Kiyoshige Kinugawa, and Yukihiro Sato, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1979, Ser. No. 68,576

Claims priority, application Japan, Aug. 23, 1978, 53-101776

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—334 **4 Claims**

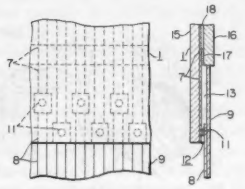
1. A liquid crystal display device comprising:

a liquid crystal portion disposed between upper and lower substrates,

a plurality of electrode terminals provided on said upper substrate,

insulating binder material connected to said electrode terminals and including electrically conductive islands penetrating through said insulating binder material, and

a plurality of lead electrodes provided on a sheet, wherein



said insulating binder material bonds said electrode terminals to said lead electrodes with said lead electrodes connected through said electrically conductive islands to said plurality of electrode terminals.

4,295,712

LIQUID CRYSTAL DISPLAY DEVICE

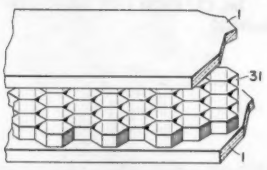
Masumi Ishiwatari, Zushi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,281

Claims priority, application Japan, Aug. 19, 1978, 53-99994

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—344 **3 Claims**



1. A liquid crystal display device comprising:

a pair of flexible, transparent plates each having a transparent electrode on one surface; and

a spacer interposed between said plate surfaces for maintaining a constant space gap therebetween, said spacer being a honeycomb-shaped structure which extends over the entire display device surface.

4,295,713

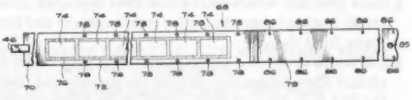
FILM AND PHOTOGRAPHIC APPARATUS

Evan A. Edwards, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 20,283, Mar. 14, 1979. This application Apr. 9, 1980, Ser. No. 138,481

Int. Cl.³ G03C *1/76*

U.S. Cl. 352—235 **2 Claims**



1. In a photographic filmstrip having an image portion and a leader; the improvement comprising:

at least one row of perforations of a pre-determined size along the image portion; and

at least one row of perforations in the leader, said perforations in the leader being aligned with and smaller in a

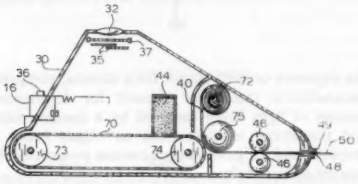
direction longitudinally of said filmstrip than the perforations along the image portion.

4,295,714

ELECTROSTATIC CAMERAS

John M. Payne, Northborough, Peterborough, England

Continuation-in-part of Ser. No. 896,823, Apr. 17, 1978, Pat. No. 4,198,139. This application Feb. 19, 1980, Ser. No. 122,636
Claims priority, application United Kingdom, Apr. 16, 1977, 15873/77; Dec. 13, 1977, 51901/77
The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.
Int. Cl.³ G03G *15/00*; G03B *9/02*
U.S. Cl. 354—3 **4 Claims**



1. A portable electrostatic camera comprising:
a light-tight housing having an aperture for admitting light;
a surface within the housing;
a shutter for controlling the passage of light through said aperture to said surface to form an optical image thereon;
a single point discharge electrode disposed within said housing between the aperture and the surface for electrically charging said surface prior to the formation of the optical image thereon, which surface modifies the charge to form an electrical image corresponding to the optical image;
a piezo-electric crystal generator disposed within said housing;
means for activating said piezo-electric generator to produce a high voltage charge for application to said single point discharge electrode;
means for ensuring that charge of only one polarity is applied to said single point discharge electrode;
means disposed within said housing for applying a printing medium to said surface for retention thereon in dependence on the level of electrical charge remaining at different points over said surface; and
an additional electrode situated within the camera housing and close to said surface on which the electrical image is formed to assist in the transfer of printing medium thereto.

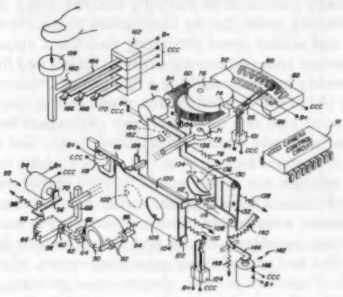
4,295,715

CAMERA MECHANISM EMPLOYING A MULTIFUNCTION CONTROL MEMBER

John J. Breen, West Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,259
Int. Cl.³ G03B *3/10*
U.S. Cl. 354—25 **4 Claims**

1. A control mechanism for use in a photographic camera, comprising:
a multifunction control member moveable between an initial position and a final position;
means for moving said control member from said initial position to said final position;
position sensor means, responsive to the movement of said control member for producing a signal representing the position of said control member;
adjustable lens means moveable from an initial position to a final position for providing a plurality of focus adjustments, said lens means including control member follower means for moving said adjustable lens means in concert with movement of said control member;
lens arresting means responsive to a focus control signal for arresting movement of said lens mean at one of said plurality of focus adjustments;
adjustable aperture means, moveable from an initial position to a final position for providing a plurality of aperture adjustments, said aperture means including control member follower means for moving said aperture means in concert with movement of said control member;
aperture arresting means responsive to an aperture control signal for arresting movement of said aperture means at one of said plurality of aperture adjustments; and
control circuit means responsive to measured scene parameter inputs, including at least subject distance and brightness, and responsive to said position signal for producing said focus control signal and said aperture control signal.

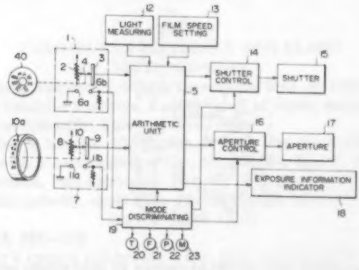


4,295,716

MODE CHANGE-OVER DEVICE FOR AUTOMATIC EXPOSURE CONTROL CAMERA

Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 25, 1979, Ser. No. 33,217
Claims priority, application Japan, Apr. 28, 1978, 53-51985
Int. Cl.³ G03B *7/14*
U.S. Cl. 354—30 **3 Claims**



1. In a dual priority automatic exposure control camera in which mode is selected among aperture priority, shutter speed priority, program control and manual control comprising a shutter speed setting means, an aperture size setting means, a light measuring means, a film speed setting means, a shutter speed control means, an aperture control means, and an exposure control means having input means connected with said shutter speed setting means, aperture setting means, light measuring means and film speed setting means and output means connected with said shutter speed control means and aperture size control means for controlling the shutter speed and the

aperture size in accordance with information inputed thereinto, each of said shutter speed setting means and said aperture size setting means comprising a variable resistor having a brush slidable therealong,

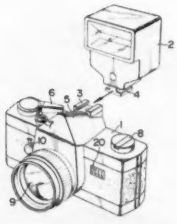
a mode change-over device comprising a first signal generating means which gives a first signal indicating whether the shutter speed is automatically controlled or manually selected, a second signal generating means which gives a second signal indicating whether the aperture size is automatically controlled or manually selected, and a mode discriminating means having input means connected with said first and second signal generating means and output means connected with said exposure control means, said first signal generating means comprising a first pair of contacts located at an end of the variable resistor of said shutter speed setting means, at least one of the first pair of contacts being connected with said mode discriminating means, and a second pair of contacts located at an end of the variable resistor of said aperture size setting means, at least one of the second pair of contacts being connected with said mode discriminating means, wherein said brush is selectively put into contact with said variable resistor or said pair of contacts in each of said first and second signal generating means, wherein the mode of aperture priority, shutter speed priority, program control and manual control is represented by the combination of said first and second signal.

4,295,717

CAMERA WITH OPERATION INDICATOR FOR AUTO-STROBO UNIT

Masahiro Kitagawa, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Apr. 25, 1979, Ser. No. 33,165
Claims priority, application Japan, May 31, 1978, 53-65128
Int. Cl.³ G03B *15/05, 17/18*
U.S. Cl. 354—33 **28 Claims**



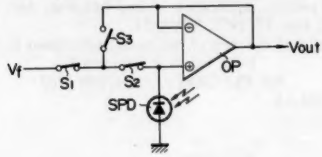
1. A camera with means to receive an auto-strobo unit, said auto-strobo unit including a first light emitting element for indicating the completion of a proper flashlight illumination and a second light emitting element for indicating the completion of a charging operation of said strobo unit; a viewfinder; and an operation indicator comprising a third light emitting element which is located within said viewfinder and which is responsive to a current flow through said first and second light emitting elements provided within said auto-strobo unit for providing an indication within said viewfinder that said charging operation and said flashlight illumination of the strobo unit have been properly completed.

4,295,718

EXPOSURE CONTROL CIRCUIT OF CAMERA

Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Jan. 7, 1980, Ser. No. 109,763
Claims priority, application Japan, Mar. 2, 1979, 54/24147
Int. Cl.³ G03B *7/081*
U.S. Cl. 354—50 **11 Claims**



1. An exposure control circuit for a camera, comprising:

a photoelectric transducer element for determining the amount of light being received by a camera containing said transducer element from an object being photographed, and for generating a current proportional to the amount of said light;

an operational amplifier having its non-inverting input terminal connected to said transducer element and its output terminal coupled to its inverting input terminal for generating an output voltage representative of the integral of said current when an object is being photographed;

a first trigger switch comprising semiconductor switch means of the type which is capable of exhibiting a leakage current when the voltage across first and second terminals of said switch means is other than zero, said first terminal of said switch means being connected to said non-inverting input terminal of said operational amplifier and to said transducer element for applying a trigger signal to said transducer element which enables said transducer element to produce said current when an object is being photographed; and

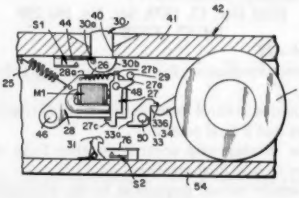
potential equalizing means for maintaining said second terminal of said trigger switch at said output voltage of said operational amplifier at all times while said transducer element is generating said current, thereby to apply a zero voltage drop across said trigger switch and eliminate the flow of leakage current therethrough.

4,295,719

BATTERY CONSERVATION BY CONTROL OF THE CHARGING CIRCUIT FOR A BUILT-IN ELECTRONIC FLASH

Karl H. Lange, Bünde, Fed. Rep. of Germany, assignor to Balda-Werke, Bünde, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,191
Int. Cl.³ G03B *7/08, 15/05*
U.S. Cl. 354—50 **4 Claims**



1. In a photographic camera system having a shutter and a flash unit for providing momentary artificial illumination of the photographic subject, the combination comprising means adaptable for connection of said camera system to a D.C.

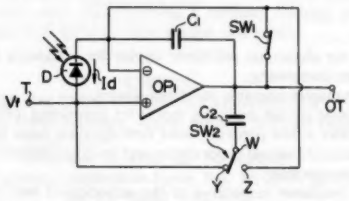
power source, a shutter release member movable from a rest position through an intermediate position to a fully depressed position, a pivotally mounted holder member mounting an electromagnet and movable in response to said movement of said shutter release member from a rest position, through an intermediate position to a fully extended position respectively, an armature pivotally mounted on said holder member and operative to move into first and second positions into and out of contact with said electromagnet in response to the energization and deengerization of said electromagnet respectively, and latching means for latching and releasing said shutter in response to said movement of said armature into and out of conctact with said electromagnet, whereby when said holder member is in said intermediate position and said armature is in said second position said shutter is released.

4,295,720

APPARATUS FOR DETERMINING LIGHT REFLECTION FROM A FOCAL PLANE SHUTTER

Kazunori Mizokami, and Masahiro Kitagawa, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Jan. 7, 1980, Ser. No. 109,762
Claims priority, application Japan, Mar. 9, 1979, 54/27848
Int. Cl.³ G03B *7/083*
U.S. Cl. 354—51 **10 Claims**



1. An apparatus for determining light reflection from a focal plane shutter of the type that includes a first shutter blind which initiates exposure of a photographic film and which has a light-reflective surface facing a direction from which light is to be admitted for exposing a photographic film, and a second shutter blind which terminates said exposure; said apparatus comprising:

a photoelectric transducer element for determining the amount of light that is reflected from the surface of the shutter blind and also from the surface of a negative when a camera that includes said apparatus contains photographic film in a position which will cause said film to be exposed by the light; said photoelectric transducers element further being for generating a photocurrent which is representative of the amount of light being received;

an integrating capacitor for integrating said photocurrent for determining proper exposure time;

a correcting capacitor for compensating for the different reflectivities of the surface of the first shutter blind and the film surface;

switch means for connecting said correcting capacitor in parallel with said integrating capacitor a predetermined time after a shutter operation; and

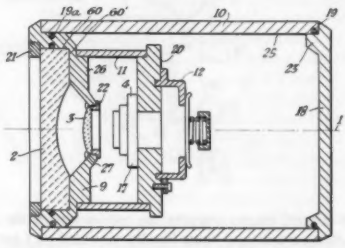
means for charging said correcting capacitor in such a manner that the voltage thereacross is the same as the voltage across said integrating capacitor at the time said corrrecting capacitor is connected in parallel with said integrating capacitor.

4,295,721

HIGH PRESSURE AND HIGH SPEED OPTICAL ENCLOSURE SYSTEM

Dimitri Rebikoff, 3060 SE 4th Ave., Ft. Lauderdale, Fla. 33315

Filed Apr. 23, 1980, Ser. No. 143,140
Int. Cl.³ G03B *17/08*
U.S. Cl. 354—64 **3 Claims**



1. A high pressure and high speed optical enclosure system for use with a film loaded camera comprising:

an external housing cylinder;

said external cylinder having a closed end and an open end;

correcting lens system means for correcting the focus of the camera when said external cylinder is submerged;

pressure resistant means for sealingly covering said open end;

said correcting lens system means operably connected to said pressure resistant means;

an internal cylinder;

a primary lens, said primary lens connected to said internal cylinder;

connecting means for connecting said internal cylinder to said pressure resistant means;

mounting means for mounting the camera within said internal cylinder;

said connecting means incudes a support which centers said internal cylinder and the primary lens of the camera mounted therein on its optical axis and holds said internal cylinder independently of said external cylinder and therefore maintains a constant distance between said primary lens and the film focal plane, and constant distance between said correcting lens system and said primary lens, connected to said pressure resistant means.

4,295,722

CAMERA FOR DAYLIGHT AND FLASH PHOTOGRAPHY

Uchiyama Takashi; Tokuichi Tsunekawa, both of Yokohama, and Takehiko Kiyohara, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

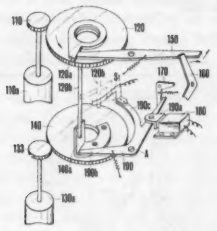
Division of Ser. No. 10,904, Feb. 9, 1979, Pat. No. 4,268,139, which is a continuation of Ser. No. 638,084, Dec. 5, 1975, abandoned. This application Dec. 17, 1979, Ser. No. 104,691
Claims priority, application Japan, Dec. 10, 1974, 49-141740
Int. Cl.³ B03B *15/03*
U.S. Cl. 354—146 **2 Claims**

1. In a camera comprising a film gate, a focal plane shutter having leading and trailing shutter curtains and a control means for triggering movement of the trailing shutter curtain, a flash synchronizing device for enabling the flash illumination of a flash unit, comprising:

(a) motion transmitting means to be driven in association with the movement of the leading shutter curtain, said motion transmitting means being located at a first position when the film gate is covered by the leading shutter curtain, and being located at a second position when the film gate is fully opened by the running of the leading shutter curtain; and

(b) a single synchronous contact switch for enabling the

flash illumination of the flash unit when the single synchronous switch is set to an operative state, said single synchronous switch being located at a position where it is driven to an operative state in response to arrival at the second position of the motion transmitting means before



the control means triggers the movement of the trailing shutter curtain, and being fixedly mounted on a part of the control means in such a positional relation that it is located at a position beyond the second position of the motion transmitting means after the control means has triggered the movement of the trailing shutter curtain.

4,295,723

SINGLE LENS REFLEX CAMERA

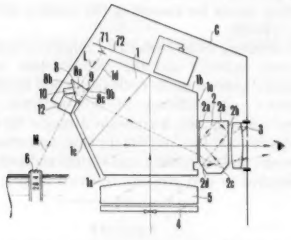
Kikuo Momiyama, Yokohama, and Kenichi Kumazawa, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1979, Ser. No. 97,833

Claims priority, application Japan, Nov. 24, 1978, 53-145114

Int. Cl.³ G03B *17/20, 19/12*

U.S. Cl. 354—155 **4 Claims**



1. A single lens reflex camera comprising:

an objective lens for forming an image of an object on a photosensitive surface and a focusing plate;

a viewfinder optical system including a pentagonal roof prism having a front non-reflecting surface and an eyepiece for observing the object's image formed on the focusing plate;

a first photographic data indicating means mounted on a lens barrel of said objective lens;

a second photographic data indicating means located on the camera off said lens barrel;

two information bearing light introducing windows on a front non-reflecting surface of said pentagonal roof prism, said two information bearing light introducing windows being arranged laterally of said front non-reflecting surface of the prism, one of said information bearing light introducing windows being offset from the middle section of said front non-reflecting surface and having a relatively small opening area, the other window being disposed across the middle section of the front non-reflecting surface and being of a laterally elongated shape having a relatively large opening area;

first optical means facing said first data indicating means for deflecting first information bearing light from said first data indicating means either to the left or right of said front non-reflecting surface of the pentagonal roof prism and for directing the first information bearing light to one of said two information bearing light introducing windows on said front non-reflecting surface;

second optical means for directing second information bearing light from said second data indicating body to the other information bearing light introducing window on said front non-reflecting surface; and

third optical means for directing said first and second information bearing light to said eyepiece.

4,295,724

ELECTRIC SELF-TIMER DEVICE FOR CAMERAS

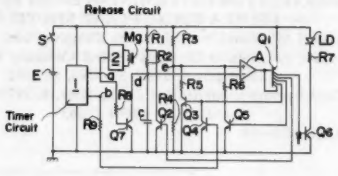
Masayoshi Sahara, Sennan, and Masaaki Nakai, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 940,107, Sep. 6, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,518

Claims priority, application Japan, Sep. 12, 1977, 52/123438

Int. Cl.³ G03B *17/18, 17/40*

U.S. Cl. 354—238 **6 Claims**



1. An electronic self-timer device for a camera having a shutter comprising:

a manually operable self-timer starter;

a timer circuit including means for generating a first signal after a first predetermined time duration from the actuation of said self-timer starter and before commencement of an exposure;

an oscillator responsive to the actuation of said self-timer starter for generating a first oscillating signal of a predetermined frequency, said oscillator being also responsive to said first signal for generating a second oscillating signal of a frequency distinguishably different from that of the first oscillating signal, a variable time constant R-C circuit, a circuit for generating an oscillating signal having a frequency dependent upon the value of the time constant of said R-C circuit, and a switching circuit responsive to said first signal from said timer circuit for changing the time constant of said R-C circuit from one value to another; and

luminous indicating means responsive to the first and second oscillating signals to be lit intermittently in accordance with the respective frequencies of the first and second oscillating signals.

4,295,725

PHOTOGRAPHIC SHUTTER

Roger Durand, Ballaigues, Switzerland, assignor to Pignons S.A., Ballaigues, Switzerland

Filed Oct. 11, 1979, Ser. No. 83,614

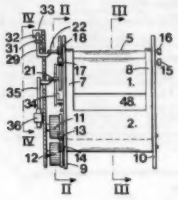
Claims priority, application Switzerland, Oct. 19, 1978, 10808/78

Int. Cl.³ G03B *9/34*

U.S. Cl. 354—244 **4 Claims**

1. A photographic shutter comprising two flexible curtains, each curtain attached by one of its edges to a first roller urged in a winding direction by a spring, each of said curtains connected by two flexible strips to a second roller which is con-

nected, on the one hand, to a setting mechanism for drawing the curtain against the action of the said spring and on the other hand, to a trip locking mechanism, said locking mechanism operating to successively unlock said second rollers, each curtain made of synthetic material and formed integrally with said flexible strips, means connecting each said first roller at one of its ends to a spring loaded device located at the end of said roller, said second rollers having at one of their ends a coupling device which can be tripped and connecting them to said setting mechanism, said second rollers co-operating with



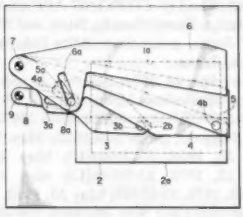
said locking mechanism at their end opposite the end having said coupling device, each second roller provided at one of its ends with a toothed pinion engaging with a toothed wheel of larger diameter, said toothed wheel including a stud projecting from one side thereof, said stud co-operating on the one hand with the locking mechanism and, on the other hand, with a stop fixing the position of the curtain at the end of operation of the shutter, said stop comprising a pawl of an arm forced against said stop by a spring, said arm having a ramp adjacent to said pawl, said ramp exerting a resilient rubbing action against said stud before it butts against said pawl.

4,295,726

BLADE TYPE FOCAL PLANE SHUTTER

Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Sep. 18, 1980, Ser. No. 188,286
Claims priority, application Japan, Sep. 20, 1979, 54-130844
Int. Cl.³ G03B *9/40, 9/08*
U.S. Cl. 354—246 **7 Claims**



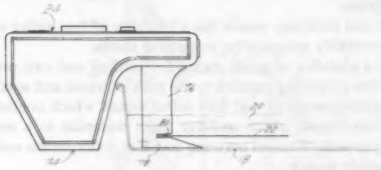
1. A focal plane shutter comprising a shutter plate having a rectangular exposure aperture formed therein, a plurality of auxiliary shutter blades rotatably supported on said shutter plate at one side of said exposure aperture to open and close said exposure aperture and having cam slots therein, an actuating member rotatably supported on said shutter plate at one side of said exposure aperture and having thereon a driving pin fitted in said cam slots, and a main shutter blade rotatably supported on two said auxiliary shutter blades adjacent to said main shutter blade with each other to open and close said exposure aperture in cooperation with said plurality of auxiliary shutter blades and capable of forming an exposure slit on said exposure aperture.

4,295,727

ELECTRICAL APPARATUS FOR COMPARING DARK AND LIGHT AREAS ON A SUBSTRATE AND WHICH SUBSTRATE IS IN A LIQUID

Douglas K. Robinson, 7512 Beverly, Edmonds, Wash. 98020

Filed Oct. 17, 1978, Ser. No. 952,202
Int. Cl.³ G03D *13/08*
U.S. Cl. 354—298 **15 Claims**



1. An apparatus for comparing opaque area and clear area on a substrate with a predetermined standard of transparency to light, said apparatus comprising:

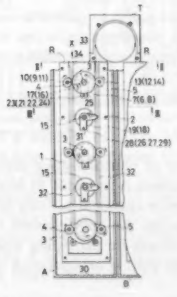
a. a source of infra-red light and a solid state device with a spectral response peak in the infra-red region;
b. said source of infra-red light and said solid state device being spaced apart so as to be capable of receiving an edge of said substrate between them;
c. said substrate being immersed in a developing solution;
d. said infra-red light continuously travels through the developing solution between the source of said infra-red light and the edge of the substrate, the edge of the substrate and the developing solution between the edge of the substrate and the solid state device;
e. said predetermined standard of transparency being a dot structure in the substrate;
f. an indicator, operatively, connecting with said solid state device; and,
g. said indicator indicating when the dot structure in said substrate meets said predetermined standard of transparency.

4,295,728

CONVEYING SYSTEM WITH SNAKE MOTION PREVENTION MEMBERS INCORPORATED THEREIN FOR PHOTO TREATMENT APPARATUS OF LONG LENGTH PHOTO-SENSITIVE SHEET MATERIALS

Kanichi Nishimoto, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Aug. 28, 1979, Ser. No. 70,539
Claims priority, application Japan, Sep. 5, 1978, 53-108104
Int. Cl.³ G03D *3/13*
U.S. Cl. 354—321 **7 Claims**



1. In an improved automatic developing apparatus for long-

length photo-sensitive sheet materials of the type having a treatment bath containment means into which means are immersed and suspended for directing, locating and controlling the path of travel of a plurality of long-length photo-sensitive sheet materials attached to the trailing end of a wide leader, said means including a plurality of roller means to fix the path of travel of a wide leader, and guide means to position said leader along said directing means, the improvement which comprises:

(a) said directing means has a plurality of free roller means rotatably mounted on respective shafts;

(b) a plurality of guide means for guiding and curl prevention extending parallel to the path of travel and spaced in juxtaposition to said free roller means which confine the long-length photo-sensitive sheet materials to a narrow gap path of travel between said free roller means and said guide means;

(c) a plurality of motion prevention means for prevention of relative sideways motion of said sheet materials, each said means being rotatably mounted on respective said shafts and having a pair of arms extending horizontally forming a space between each pair of arms into which fit said free roller means and which horizontal arms extend toward said guide means to close up the sides of the narrow gap formed between said guide means and said free roller means so as to limit the amount of relative sideways motion in the long-length photo-sensitive sheet materials by further defining the desired travel path; and

(d) a plurality of counter balancing means respectively associated with the rotatably mounted plurality of said motion prevention means which normally locate the said pairs of arms thereof in the horizontal position and which provide forces to return said motion prevention means to the original position after the arms are displaced by contact with a wide leader so as to allow the wide leader to pass by.

4,295,729

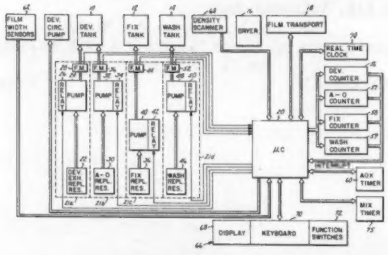
AUTOMATIC ANTI-OXIDATION REPLENISHER CONTROL

Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Jul. 14, 1980, Ser. No. 168,020

Int. Cl.[3] G03D *3/06*

U.S. Cl. 354—324 **8 Claims**



1. In a processor of photosensitive material in which anti-oxidation replenishment is provided to processor fluid to compensate for changes in chemical activity of the processor fluid due to aerial oxidation, the improvement comprising:

real time clock means for providing time of day signals;

storage means for storing an operating schedule of the processor; and

control means for controlling anti-oxidation replenishment as a function of the time of day signals and the operating schedule.

4,295,730

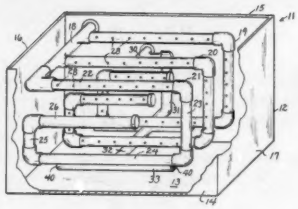
WASHER FOR RESIN-COATED PHOTOGRAPHIC PRINTS

David R. Fraser, Davis, Calif., assignor to The United States of America as represented by the Secretary of Health and Human Services, Washington, D.C.

Filed Jul. 31, 1980, Ser. No. 174,238

Int. Cl.[3] G03D *3/04*

U.S. Cl. 354—325 **16 Claims**



1. A print-washing apparatus comprising a tank; a water inlet conduit mounted in the upper portion of said tank; a plurality of spaced parallel vertically arranged looped spray pipes located beneath the upper liquid level of said tank and communicatively connected to said water inlet conduit and defining vertical print-receiving spaces therebetween below the upper surface level of said tank; said looped spray pipes each having a plurality of water jet-forming apertures located along the entire length thereof; means to force water through said water inlet conduit and through said looped spray pipes and through said plurality of water jet-forming apertures so as to provide water jets on the surface of prints received in said vertical print-receiving spaces; means to soften the impact of said water jets to achieve a gentle washing action when in use, said means comprising a level of water in said tank when in use above the upper level of said looped spray pipes; a horizontally extending drain pipe array in the bottom portion of said tank and having a plurality of spaced inlet ports to receive waste water; and vertically arranged siphon discharge conduit means communicatively connected to said drain pipe array.

4,295,731

ELECTROSTATIC COPYING APPARATUS

Koichi Sasaki, Osaka; Yasuji Sumida, Nara, and Hiroshi Ishida, Ibaragi, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Apr. 11, 1979, Ser. No. 29,053

Claims priority, application Japan, Apr. 17, 1978, 53-45490; Apr. 17, 1978, 53-50972[U]; Apr. 17, 1978, 53-50973[U]; Apr. 19, 1978, 53-47309; May 23, 1978, 53-61822; May 23, 1978, 53-70043[U]; May 23, 1978, 53-70044[U]; May 23, 1978, 53-70045[U]; May 23, 1978, 53-70046[U]; May 23, 1978, 53-70047[U]; May 30, 1978, 53-65949; May 30, 1978, 53-74580[U]; May 30, 1978, 53-74581[U]; May 30, 1978, 53-74582[U]; May 31, 1978, 53-66119[U]

Int. Cl.[3] G03G *15/00*

U.S. Cl. 355—14 R **6 Claims**

1. An electrostatic copying apparatus comprising:

an original document carrier;

an optical device including an exposure lamp;

an endless loop member mounted for movement about first and second wheels and connected to a part of one of said original document carrier or said optical device;

a moving member fixed to said part for movement thereby in an exposure moving direction;

a roll supply of copying paper from which copying paper is movable along a path sequentially through a paper cutting zone including a paper cutting unit, a charging zone including a charging device, an exposure zone including an

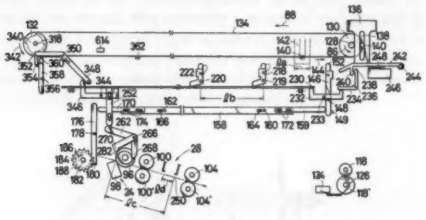
exposure device, a developing zone including a developing device, and a fixing zone including a fixing device;

paper feed means for feeding copying paper from said supply to said paper cutting zone whereat said paper cutting unit severs said copying paper into predetermined lengths;

pivotally mounted paper feed detecting, exposure detecting, paper cut detecting and de-energization detecting members sequentially disposed along the path of said moving member in said exposure moving direction and spring biased to locations to be sequentially contacted by said moving member and moved thereby to respective actuated positions;

copying paper feed linkage means, associated with said paper feed detecting member and with said paper feed means, for, upon said moving member moving said paper feed detecting member to said actuated position thereof, actuating said paper feed means to initiate feeding of said copying paper;

exposure linkage means, associated with said exposure detecting and de-energization detecting members and with



said exposure lamp, for, upon said moving member moving said exposure detecting member to said actuated position thereof, actuating said exposure lamp, and for, upon said moving member moving said de-energization detecting member to said actuated position thereof, de-energizing said exposure lamp;

paper cut linkage means, associated with said paper cut detecting means and paper cutting unit, for upon said moving member moving said paper cut detecting member to said actuated position thereof, actuating said paper cutting unit to sever copying paper being fed by said paper feed means;

position detecting means for adjusting and setting the positions of said paper cut detecting member and of said de-energization detecting member along said path of said moving member; and

the distance between said paper cut detecting member and said de-energization detecting member being at least as great as the distance between the cutting position of said paper cutting unit and the upstream end of said exposure zone in the direction of feeding of said copying paper.

4,295,732

BOUND DOCUMENT APPARATUS LATCHING MECHANISM

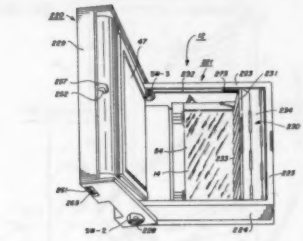
Charles J. Hull, Fairport; James E. Hutton, Webster, and Teri J. Mahuson, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

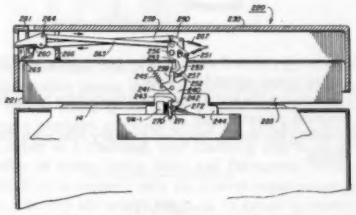
Filed Oct. 30, 1979, Ser. No. 89,341
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **9 Claims**

1. In an electrostatographic reproduction machine having a support frame, document handling apparatus for advancing document sheets from a stack to an exposure platen, and an electrostatographic processor for processing copy sheets of the document sheets when exposed, the improvement comprising:

a housing for containing the document handling apparatus, pivotal support means on the machine frame and connected to said housing for permitting the pivotal movement of the document handling apparatus toward and away from the exposure platen,

a bound document cover assembly detachably retained by said housing, said cover assembly being connected to said pivotal support means and movable as a unit with said housing to expose the exposure platen for manual use, said housing being pivotally related to said cover assembly





whereby the latter may be maintained on said platen while said housing is in a pivoted raised position, so as to permit bound document copying,

a latching arrangement including a first latch mechanism associated with said housing for attaching the same to said cover assembly and a second latch mechanism associated with said cover assembly for attaching the same to the support frame of the machine.

4,295,733

AUTOMATIC ERROR COLLATOR CAPACITY CONSTRAINTS USING SPARE BIN STRATEGY

Donovan M. Janssen, and William S. Seaward, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1979, Ser. No. 101,678
Int. Cl.³ B65H *31/24*; G03G *15/00*
U.S. Cl. 355—14 SH **12 Claims**

1. In a copying system having a cycling automatic document feed and an automatic unloading apparatus, a device to recover from an overflow collator condition comprising in combination:

a sorter means for containing a plurality of copy sheets of an original document, said sorter means having an advertised set of bins and a number of spare bins for containing overflow copies from the advertised bins;

a loading means associated with the sorter means and operable to load an optimum number of copies into the advertised bins and overflow copies into the spare bins; and

an unloading means including an automatic unloading apparatus for forming a complete collated set of copies by merging copies from the advertised bins and the spare bins.

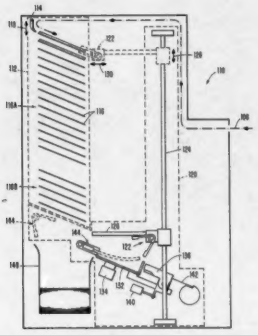
10. A method for controlling the operation of a sheet collator when the capacity M of each primary bin is less than the

number of sheets N to be collated in one set, said method comprising of the following steps:

(1) providing a set of auxiliary bins for containing overflow copy sheets;

(2) loading each primary bin to its capacity with M copy sheets;

(3) loading the auxiliary bins with the (N-M) copy sheets;



(4) forming collated copy sets by combining sheets from the primary and secondary bins;

(5) increasing the initial set of auxiliary bins by adding newly emptied primary bins; and

(6) loading the newly emptied primary bins with (N-M) copy sheets.

4,295,734

FILTER ASSEMBLY FOR COLLECTING USED TONER OF ELECTROPHOTOGRAPHIC COPYING MACHINE

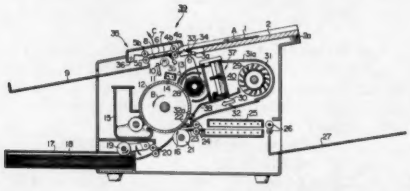
Hiroshi Tsuda, Mitaka; Kiyoshi Miyashita, Hachioji; Masaji Nishikawa, Hachioji; Akira Shimizu, Hachioji, and Muneo Kasuga, Hachioji, all of Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Dec. 17, 1979, Ser. No. 104,444

Claims priority, application Japan, Feb. 1, 1979, 54/10912

Int. Cl.[3] G03G *15/00*

U.S. Cl. 355—15 **11 Claims**



1. In an electrophotographic copying machine including a brush which rotates while maintaining its contact with a member which carries an electrostatic latent image to remove any residue of unnecessary toner which remains attached to said member, a suction fan for producing an airstream which conveys the toner removed by said brush, and a filter assembly disposed in the path of the airstream for collecting used toner; the improvement comprising:

(a) a one piece filter cassette having a toner receiver compartment and a separate filter holder compartment formed therein, said filter holder compartment receiving a replaceable filter element therein, said toner receiver compartment being located upstream of said filter holder compartment in a position which permits toner which strikes said filter element and falls down in front of said filter element to form a pile therein; and

(b) means for positioning said filter cassette in the path of the airstream formed within the copying machine, said filter cassette and positioning means cooperating in such a manner that said filter cassette can be slidably placed in and slidably removed from said positioning means, said positioning means including a labyrinth arrangement for forming a labyrinth seal between said filter cassette and said positioning means when said filter cassette is mounted in said positioning means such that said airstream passes through said cassette but does not pass between said cassette and said positioning means.

4,295,735

OPTICAL PROJECTION SYSTEM HAVING A PHOTOREPETITION FUNCTION

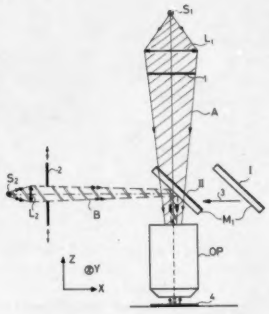
Michel Lacombat, and Andre Gerard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 26, 1980, Ser. No. 124,743

Claims priority, application France, Feb. 27, 1979, 79 05008

Int. Cl.[3] G03B *27/52, 27/70*

U.S. Cl. 355—43 **9 Claims**



1. An optical system for projecting patterns in order to reproduce the image of at least one modulating object on a semiconductor wafer coated with photo-sensitive material or on a mask, said optical system being provided with a projection objective and with at least one source of light energy for the illumination of the modulating object, wherein said projection system comprises at least one first reticle and a second reticle each adapted to carry a modulating object, and reflecting optical means comprising at least one movable plane mirror adapted to permit the formation of at least one first optical path and a second optical path in order that the image of said modulating objects carried by said first and second reticles may be projected alternately on said semiconductor wafer or on said mask by switching said movable mirror.

4,295,736

OPTICAL ASSEMBLY FOR USE IN COPYING MACHINE

Hiroshi Ikeda, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 14, 1979, Ser. No. 94,313

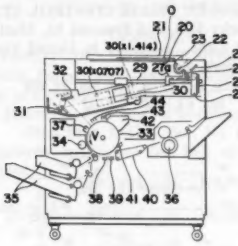
Claims priority, application Japan, Nov. 14, 1978, 53-157174

Int. Cl.[3] G03B *27/34, 27/40, 27/70*

U.S. Cl. 355—57 **10 Claims**

1. An optical assembly for use in a copying machine of a type including an enlarged size reproduction mode and a reduced size reproduction mode each having the same conjugate distance, said assembly comprising: a projecting lens assembly, a reflective mirror assembly, a drive mechanism connected to said projecting lens assembly for driving said lens assembly between first and second lens assembly positions corresponding to the positions of said lens assembly for the respective reproduction modes, a mechanism connected to said mirror assembly for driving said mirror assembly to a single predeter-

mined mirror assembly position which is the position of said mirror assembly for both reproduction modes, means for adjusting the mirror assembly position of said mirror assembly for proper focal adjustment for the condition in which said projecting lens assembly is at the first lens assembly position



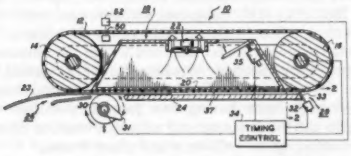
corresponding to the one reproduction mode, and means for adjusting the second lens assembly position of said projecting lens assembly for proper focal adjustment for the condition in which said projecting lens assembly is at the second lens assembly position for the other reproduction mode and said mirror assembly is in the adjusted mirror assembly position.

4,295,737

GROOVED BELT DOCUMENT REGISTRATION SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1980, Ser. No. 111,062
Int. Cl.[3] G03B *27/62, 27/64*
U.S. Cl. 355—76 **8 Claims**



1. In an original document handling apparatus for moving successive individual document sheets on the surface of a movable belt into a registered position for copying at a copier imaging station, including registration means cooperatively engaging said belt and movable into and out of the path of said documents for their registration, the improvement wherein:

said movable belt has a plurality of narrow elongated permanent grooves therein,

said grooves extend in the direction of movement of said belt below said surface thereof,

said grooves are transversely spaced on said belt,

said grooves have gently sloped walls to avoid reproducible shadows thereof at said copier imaging station, and

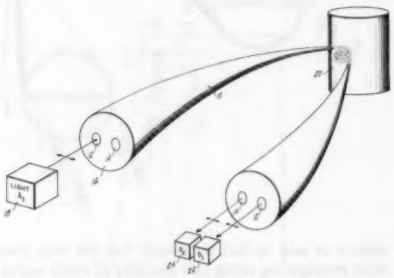
said registration means comprises at least two registration fingers transversely spaced corresponding to at least two of said grooves and narrower than said grooves and adapted to interfit into said grooves for the registration of said documents against said registration fingers without slippage between said documents and said fingers.

4,295,738

FIBER OPTIC STRAIN SENSOR

Gerald Meltz, Avon, and Elias Snitzer, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 71,512, Aug. 30, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 162,283
Int. Cl.[3] G01B *11/16*
U.S. Cl. 356—32 **11 Claims**



1. A strain monitor, comprising:

strain responsive means including an optical fiber positionable where strain is to be measured, said optical fiber having a plurality of cores which are spaced apart from each other in a cladding, said cladding and each of said plurality of cores being sized and fabricated from such materials as to support only the lowest order propagation mode, thereby allowing cross-talk to occur between said cores;

source means for generating light to be coupled into one of said cores, said light being cross-talked to adjacent cores in a manner related to strain acting on said optical fiber;

detector means for receiving light energy emerging from each of said plurality of cores, and for providing an electrical signal related to the intensity of said emerging light; and

whereby a strain acting on said optical fiber causes a change in the dimensions and refractive indices of said plurality of cores and said cladding such that mode interference between the modes of propagating light energy within said plurality of cores produces a change in the intensity of light emerging from said cores which is uniquely related to such strain acting on said optical fiber.

4,295,739

FIBER OPTIC TEMPERATURE SENSOR

Gerald Meltz, Avon, and Elias Snitzer, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 71,512, Aug. 30, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 162,284
Int. Cl.[3] G01J *5/38*
U.S. Cl. 356—43 **11 Claims**

1. A temperature monitor, comprising:

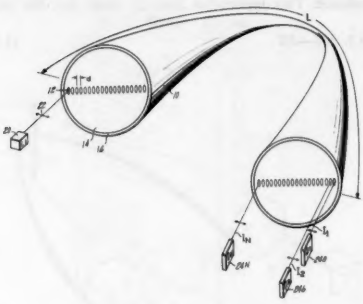
temperature responsive means including an optical fiber having a plurality of cores in a cladding, said plurality of cores being positioned in an array and extending continuously along the entire length of said optical fiber to allow cross-talk therebetween, said cladding and each of said plurality of cores being sized and formed from such materials as to support only the lowest order mode;

source means for generating light to be coupled into one of said plurality of cores, said light being cross-talked to adjacent cores in a manner related to the temperature along the length of said optical fiber;

detector means for receiving light energy emerging from

each of said plurality of cores and for providing an electrical signal indicating the intensity of said emerging light; and

whereby a temperature change along the length of said optical fiber causes a change in dimensions and refractive



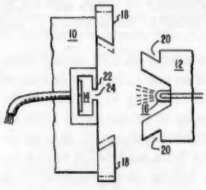
indices of said optical fiber such that the beat phase of light propagating along said plurality of cores varies as a function of temperature causing a change in intensity of light emerging from said plurality of cores of said optical fiber which is uniquely related to the temperature along said optical fiber.

4,295,740

PHOTOELECTRIC DOCKING DEVICE

Robert H. Sturges, Jr., Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 5, 1978, Ser. No. 939,555
Int. Cl.³ G01B *11/26*; B64G *1/62*
U.S. Cl. 356—152 **13 Claims**



1. A photoelectric docking device for remotely positioning in three dimensional space a first member relative to a second member comprising:

a point light source fixedly connected to the first member and directed to focus a narrow beam of light along a pre-established path;

a photosensor fixedly connected to the second member, which is responsive to the reception of light from the point light source on the first member to provide electrical outputs representative of the relative position of the point source with respect to the photosensor in three dimensional space, the photosensor having at least three electrical outputs taken from substantially symmetric locations over the photosensitive area of the cell;

means for processing the photosensor outputs into a second set of electrical outputs representative of the cartesion coordinates of the first member with respect to the second;

means for displaying the electrical outputs as a pictorial representation of the relative position of the first and second members in three dimensional space;

means for detecting physical contact between the first and second members and providing an electrical signal representative thereof; and

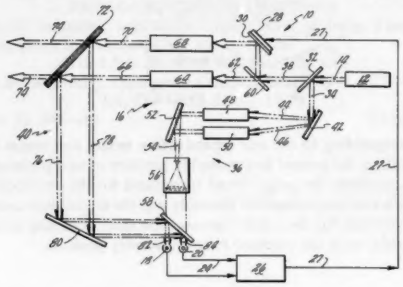
means responsive to the signal to provide a remote indication of such contact.

4,295,741

TWO-WAVELENGTH PHASE CONTROL SYSTEM

Gary E. Palma, Rocky Hill, and Francois M. Mottier, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 30, 1979, Ser. No. 71,509
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—349 **12 Claims**



1. An adaptive optics control system for mitigating $2\pi N$ ambiguity in error signals for the control of the phase distribution of an output beam from a multi-line laser comprising:

an interferometer having a reference leg, a phase leg, means for directing a first portion of an input beam having a multi-line spectrum from a laser to the phase leg for providing phase beams and for directing a second portion of the input beam to the reference leg for providing a reference beam and means for combining the reference beam and phase beams for providing signal beams;

means disposed within the reference leg for separating from the second portion of the input beam at least a first beam at a first wavelength and a second beam at a second wavelength and for directing said first beam to a first frequency shifter and said second beam to a second frequency shifter;

a first frequency shifter disposed within the reference leg for providing a first frequency shift of the first beam;

a second frequency shifter disposed within the reference leg for providing a second frequency shift of the second beam;

means for combining the first beam and the second beam into a reference beam having two frequency shifted wavelengths and for directing said reference beam to the means for combining the reference and phase beams;

means disposed within the phase leg for separating the first portion of the input beam into at least two amplifier beams and for directing said amplifier beams to at least two optical amplifiers;

at least two optical amplifiers disposed within the phase leg for amplifying each of said amplifier beams to provide at least two output beams having high power;

coupler means for passing a first portion of each of the output beams out of the interferometer as target beams and for directing a second portion of the output beams through the phase leg as phase beams to the means for combining the reference beam and the phase beams;

at least two detectors in optical alignment with the signal beams wherein each detector is in register with the output beam of one of the optical amplifiers for providing electrical output signals and wherein one detector is a standard detector;

a phase control system responsive to the electrical output signals for providing fine error signals and coarse error signals to actuator means; and

actuator means responsive to the fine and coarse error sig-

nals attached to the means for directing said amplifier beams to the optical amplifiers for adjusting the optical path difference between each of the output beams for providing phase-matching of the phase distribution of each of the output beams for providing target beams having high optical quality.

4,295,742

LONGITUDINAL MEASURING DEVICE

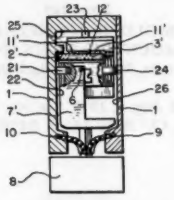
Gunther Nelle, Bergen, and Gunter Swassek, Traunreut, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 17,057

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810341

Int. Cl.³ G01B *11/14*

U.S. Cl. 356—373 **6 Claims**



1. An apparatus for positioning a scanning unit in a longitudinal measuring device, said measuring device including a measuring scale, a driving unit for connecting the device to an object whose position is to be measured, and first and second mutually perpendicular guide surfaces for guiding the scanning unit along the scale, said apparatus comprising:

a support structure positioned alongside the scale;

means for connecting the scanning unit to the driving unit in a flexible manner, said connecting means including a coupling element connected between the scanning unit and the driving unit and operative to maintain a substantially constant spacing therebetween;

first spring means positioned to exert a spring force between the scanning unit and the support structure, for biasing the scanning unit into contact with the first guide surface formed by the scale and substantially in no other direction; and

second spring means positioned to exert a spring force between the scanning unit and the support structure, for biasing and scanning unit into contact with the second guide surface formed by the support structure ane substantially in no other direction, said two spring means operating substantially independently of each other.

4,295,743

APPARATUS FOR DETERMINING FAULTS IN STRIP MATERIAL

Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick GmbH, Optik-Elektronik, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,534

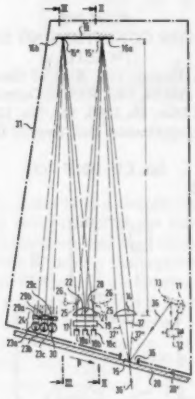
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827705

Int. Cl.³ G01B *11/30*

U.S. Cl. 356—431 **18 Claims**

2. Apparatus for determining faults in a strip of material comprising means for generating a scanning light bead on the strip, a first cylindrical lens extending over the scanning region with its focal line extending optically parallel to the direction of movement of the scanning light bead on the strip, first and second strip-like cylindrical mirrors arranged behind the focal line and optically spaced apart from one another by the distance of their focal lengths and with their focal lines optically at right angles to the direction of movement of the scanning light bead on the strip, a second cylindrical lens cooperating with the first and second cylindrical mirrors, and a light receiving device illuminated from the second cylindrical lens and having at least one light conducting rod for receiving light from the second cylindrical lens along a surface region and for transmitting this light to at least one photoelectric converter arranged at an end face of the light conducting rod the arrangement being such that:

(a) the first cylindrical lens images the scanning light bead on the first cylindrical mirror;



(b) the first cylindrical mirror reflects the incident light to the second cylindrical lens which is arranged parallel to the first cylindrical lens and spaced from the first cylindrical mirror by its focal length;

(c) a plane mirror is arranged behind the cylindrical lens at least along a part of its length and reflects the incident light through the second cylindrical lens to the second cylindrical mirror; and

(d) the second cylindrical lens is passed through twice on account of the arrangement of the plane mirror and images the surface of the first cylindrical mirror on the surface of the second cylindrical mirror.

4,295,744

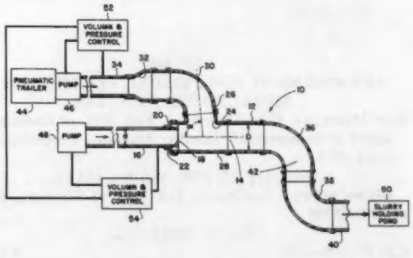
SLURRY GUN

William F. Scriminger, Muskogee, Okla., assignor to Muskogee Environmental Conservation Co., Muskogee, Okla.

Filed Apr. 23, 1979, Ser. No. 32,165

Int. Cl.³ B28C *5/06*

U.S. Cl. 366—3 **3 Claims**



1. A method for mixing a slurry of fly ash and a wetting agent comprising the steps of:

(a) introducing the wetting agent horizontally into an intro-

duction chamber under pressure and at a controlled volume;

(b) introducing aerated fly ash downwardly into said chamber under a pressure less than that of the wetting agent and at a controlled volume of air and a controlled amount of fly ash carried by the air; and

(c) creating turbulence downstream of the introduction chamber by passing the wetting agent and aerated fly ash through a contorted path for thoroughly mixing the fly ash and wetting agent.

4,295,745

APPARATUS FOR CONDITIONING BIOINJURIOUS WASTE

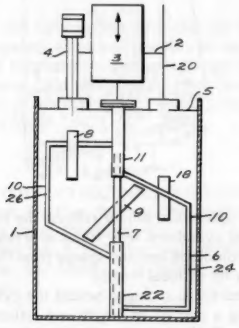
Herbert Brunner, Hanau, Fed. Rep. of Germany, assignor to Nuken GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,815

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910878

Int. Cl.³ B01F *7/32*

U.S. Cl. 366—302 **6 Claims**



1. In apparatus for conditioning bioinjurious pumpable waste, especially radioactive waste, by forced mixing with a settable binder in a final storage container having stirrer means installed therein, the improvement comprising:

said stirrer means being constructed of a rotatable portion and a portion fixed to the container,

said rotatable portion comprising closed frame means providing at least two opposite stirrer arm means secured to a hollow central shaft having at least two axially spaced parts,

said fixed portion comprising a rod-like part extending upright from the central portion of the bottom of the container with said hollow shaft being journalled thereon, said rod-like part being provided with at least one mixing element secured thereto at a location thereon between said shaft parts.

4,295,746

ARRANGEMENT FOR FEEDING ELECTRODES IN METAL PAPER PRINTERS

Kurt Hartmann, Calw-Heumaden, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1980, Ser. No. 143,691

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935595

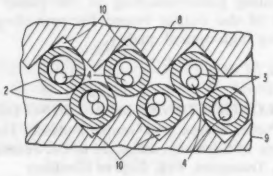
Int. Cl.³ B41J *3/02*

U.S. Cl. 400—119 **4 Claims**

4. Apparatus for allowing the withdrawal of one of a pair of contacting electrodes with respect to the other comprising:

at least one first and one second elongate electrode;

a flexible tube surrounding said electrodes for holding said electrodes in contacting juxtaposition, said tube being of an electrically insulative material; and



guide means having at least one groove therein adapted to receive a said tube, said groove being a depth less than the diameter of a said tube.

4,295,747

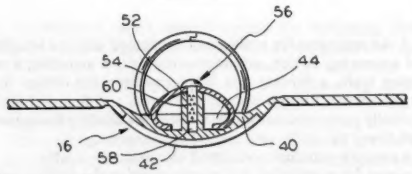
INTEGRALLY MOLDED, LOOSELEAF BOOKS WITH RING-BINDER-MOUNTING POSTS MOLDED ON SPINE

Dominic R. Errichiello, 389 Meadowlark Rd., Bloomingdale, Ill. 60108

Filed Aug. 6, 1979, Ser. No. 63,864

Int. Cl.³ B42F *13/12*; B42D *3/00*

U.S. Cl. 402—75 **5 Claims**



1. An integrally molded looseleaf book constructed of a thermoplastic polymer material having a snap-ring assembly mounted therein, said looseleaf book comprising:

a spine having front and rear cover panels hingedly mounted on respective opposite, longitudinal edges thereof by means of living hinges;

two or more posts formed in the inner front face of said spine;

means for mounting the matrix strip of said snap-ring on said posts; and

a longitudinal cavity formed in the inner front face of said spine and extending substantially the full length of said spine, said posts being integrally molded in the bottom wall of said spine cavity, and said matrix strip being positioned longitudinally in said cavity.

4,295,748

MOUNTING STRUCTURE FOR MAGNETRONS

Ichiro Ohara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1979, Ser. No. 4,292

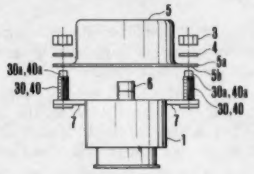
Claims priority, application Japan, Jun. 9, 1978, 53-77920[U]

Int. Cl.³ F16B *17/00*

U.S. Cl. 403—24 **1 Claim**

1. A mounting structure for magnetrons comprising a flange having bolting bore-holes therein secured to a wave guide to provide a surface side to be mounted with the magnetron, a mounting plate secured to said magnetron, and a plurality of stud bolts each having a head, a mounting portion adjacent said head, threads and a tip portion without threads having a diameter which is equal, at the most, to the diameter of bottom of thread of said stud bolt, fastening means operative on said mounting portion of said stud bolts with said tip aligned with

said bore-holes for permanently fixing said stud bolts integral with said mounting plate and clamping means aligned by said



tips for engaging said threads on said stud bolts passed through said bore-holes and tightened by rotating said clamping means on said tips as an axis on the other side of flange.

4,295,749

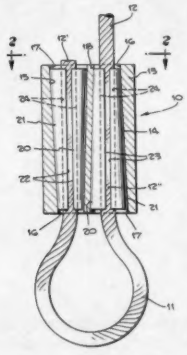
EYE SPLICE FITTING

Jack L. McBride, 3622 Barbara St., San Pedro, Calif. 90731

Filed Aug. 15, 1979, Ser. No. 66,621

Int. Cl.³ F16G *11/04*

U.S. Cl. 403—211 **3 Claims**



1. A fitting for anchoring therein a section of a rope-like strand comprising a housing having a hole extending therethrough, said hole having a frustoconical interior shape with a small end thereof greater in diameter than the diameter of said rope-like strand, a pair of longitudinally separated wedge sections which when placed together comprise a composite plug having a furstoconical exterior complementary to the frustoconical interior of the hole in the housing, each said wedge section having a semi-cylindrical recess presenting an arcuate surface extending from end to end with a curvature substantially matching the curvature on the surface of the strand, said wedge sections being adapted to fit around opposite sides of the strand and jamb into the hole whereby to anchor the strand in the housing, the combined depths of the semi-cylindrical recesses being less than the diameter of the rope-like strand, said housing having a second hole substantially parallel to the first hole, said second hole having a smooth interior of diameter greater than the diameter of said rope-like strand.

4,295,750

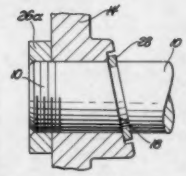
SHAFT-COMPONENT CONNECTION MEANS

Erwin F'Geppert, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 23, 1980, Ser. No. 152,920

Int. Cl.³ B25G *3/00*

U.S. Cl. 403—259 **5 Claims**



1. In an assembly comprising a circular shaft, a mechanical component having two external planar faces and a circular bore extending therebetween, said shaft extending through the bore as a non-wobble fit therein: the improvement wherein at least one of the aforementioned external planar faces is acutely angled to the bore axis; first abutment means carried by the shaft in facial engagement with the acutely angled planar face on the mechanical component; and second abutment means carried by the shaft in facial engagement with the other planar face on the mechanical component; the angle taken by the acutely angled planar face being sufficient to prevent relative rotation between the shaft and the mechanical component; said first abutment means being a snap ring seated in a peripheral groove in the shaft so that a side surface of the ring engages the acutely angled planar face on the mechanical component.

4,295,751

THREAD STRUCTURE FOR PERCUSSION DRILL ELEMENTS

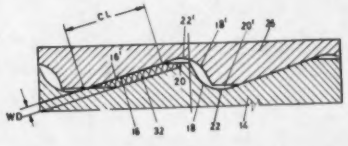
John M. Holmberg, Selcourt Springs, South Africa, assignor to Boart International Limited, Johannesburg, South Africa

Filed Sep. 21, 1979, Ser. No. 77,549

Claims priority, application South Africa, Sep. 21, 1978, 78/5370

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—306 **20 Claims**

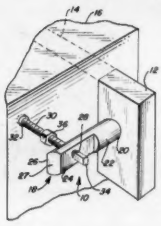


1. A coupling thread structure for percussion drill elements including a rod having an external thread and a sleeve having an internal thread with the threads, when the rod and sleeve are coupled together, presenting abutting and non-abutting flanks and with the flanks being joined by crest and bottom portions, wherein the thread has at least two starts; the abutting flanks are straight along their whole abutting contact portions; the abutting flank portions form an angle of between 10° and 25° with the drill axis; and the pitch angle of the threads is between 9° and 20°.

4,295,752
RETAINING ASSEMBLY

John A. Lerch, Signal Mountain, Tenn., assignor to Vulcan Iron Works Inc., Chattanooga, Tenn.

Filed Jan. 29, 1979, Ser. No. 7,316
Int. Cl.[3] B25G 3/00; F16D 1/00; F16G 11/00
U.S. Cl. 403—317 12 Claims

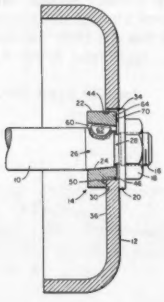


1. A retaining assembly for retaining a key in a housing of a ram or the like wherein said housing includes a slot in which said key is to be retained, said assembly comprising,
- a mechanical connecting member secured to said key, said connecting member including an aperture,
- a force application member including a first end extending through said aperture and a second end abutting said housing, and
- a force generating element mounted on said force application member between said housing and said mechanical connecting member, said force generating member adapted to generate a force against said mechanical coupling member and said housing whereby said key is retained in said slot.

4,295,753
TORQUE TRANSMITTING APPARATUS

Adolf Luerken, Palos Verdes, and William D. Vogel, Arcadia, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed Nov. 10, 1977, Ser. No. 850,137
Int. Cl.[3] F16D 1/08
U.S. Cl. 403—365 12 Claims



1. Apparatus for mounting a rotatable component on a tapered rotating drive shaft comprising

an intermediate torque transmitting hub member having
- a tapered internal bore extending in a longitudinal directional from a shaft receiving aperture at a first surface of said member to a narrowed exit aperture at a second surface of said member,
- a recessed shoulder extending around a peripheral surface of the member, for seating said rotatable component, said shoulder being substantially concentric with the longitudinal axis of said bore,
- a shoulder cutout around an inner periphery of said shoulder,
- a plurality of narrow, longitudinally extending rib members spaced-apart on and supported by an outside peripheral surface of said member,

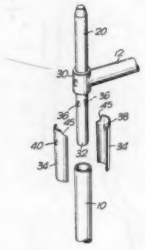
whereby said tapered drive shaft passes through said intermediate member, the internal taper of the intermediate member matches the taper of the drive shaft, said rotatable component, when it is seated, contacts said shoulder only at an outside annulus of said shoulder, and the rotatable component, when seated against said recessed shoulder for the first time, mechanically distorts the original shape of said rib members, and

drive torque is transferred from said drive shaft to said intermediate member through the interior surface of the member tapered bore, and from the member shoulder, through friction contact, to the rotatable component.

4,295,754
DISPLAY STRUCTURES AND THE LIKE

Christopher J. Ashton, Kimpton; Andrew C. Diamond, Wellwyn Garden City, and Derek H. Greenhill, Bromsgrove, all of England, assignors to Marler Haley Exposystems Limited, England

Filed Mar. 29, 1979, Ser. No. 24,943
Claims priority, application United Kingdom, Apr. 7, 1978, 13831/78
Int. Cl.[3] F16B 2/14
U.S. Cl. 403—369 5 Claims



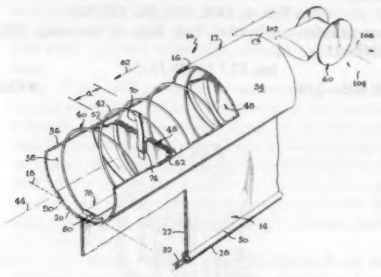
1. A plug and socket connection including a first member defining a socket and a second member defining a plug which is received in said socket, a diametrically split collet being disposed in the socket and being wedged between, and resiliently deformed between, a surface constituted by the periphery of the plug and a surface constituted by an opposing socket wall, at least one of the surfaces between which the collet is disposed being substantially cylindrical, the collet being formed by two similar half-round parts, whereby in the assembled plug and socket connection the collet has a said longitudinal slit in opposite longitudinal sides thereof, each said half-round part of the collet being of greater curvature at one end than at the other so that each said edge of each said slit forms a cutting edge which penetrates said substantially cylindrical surface and is forced into the member providing said surface, thereby preventing relative rotation, about the axis of said substantially cylindrical surface, between, on the one hand, the collet and, on the other hand, the member providing said substantially cylindrical surface, said two parts of the collet being nonrotatably engaged with the other of the members between which the collet is wedged, whereby relative rotational movement of the collet is prevented.

4,295,755

REEL MOUNTABLE BOOM ARRANGEMENT

Frank Meyers, 317 Calle Mayor, Redondo Beach, Calif. 90277

Filed Apr. 30, 1980, Ser. No. 145,217
Int. Cl.³ E02B *15/04*
U.S. Cl. 405—66 **66 Claims**



1. In an improved containment boom section, the improvement comprising, in combination:

flotation means having a predetermined buoyancy to provide upper portions thereof above the surface level of a liquid body for the condition of the boom section deployed in said liquid body, and a lower portion, below the surface level of said liquid body;

said flotation means comprising:

a longitudinally elongated, flexible, generally tubular member having walls defining an internal cavity, upper portions and lower portions and said tubular member transversely collapsible-expandable, between a transversely flattened, storage condition and a transversely expanded, deployed condition, and said elongated, flexible, generally tubular member windable on a reel in said transversely flattened storage condition;

a resilient, generally spring-like member having a plurality of helical coil means about a longitudinally extending helix axis and said helical coils having a predetermined helix angle in a helical condition thereof, and said spring-like member extending longitudinally in said cavity of said tubular member, and said helical coils maintaining said walls of said tubular member in said transversely expanded, deployed condition thereof for said spring-like member in said helical condition thereof, and said spring-like member resiliently deformable from said helical condition to a transversely flattened condition for said tubular member in said transversely flattened storage condition thereof, and said spring-like member having a predetermined energy stored therein in said transversely flattened condition, and said predetermined energy having a value at least equal to the energy required to cause said spring-like member to move from said transversely flattened condition to said helical condition thereof for said flotation means deployed in said liquid body;

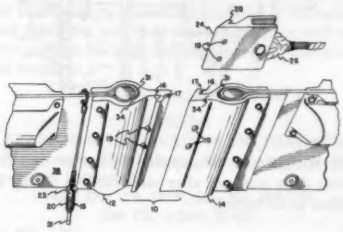
a plurality of pocket means in said cavity of said tubular member, and coupled to the walls thereof in a predetermined, spaced array, each of said pocket means having walls defining a coil receiving cavity having side edges extending a predetermined distance around said walls of said tubular member, from regions adjacent said lower portions thereof toward regions adjacent said upper portions thereof, and said side edges of said pocket means positionable adjacent said walls of said tubular member for said tubular member in said transversely expanded, deployed condition thereof, and one of a first group of said plurality of coil means of said spring-like member in said coil receiving cavity of each of said pocket means, and each of said pocket means movable from a transversely upright position for said tubular member in said transversely expanded, deployed condition thereof to a flattened position for said tubular member in said transversely flattened condition thereof.

4,295,756

FLOATING BOOM END CONNECTORS

Russell M. Blair, Westport, Conn., assignor to Slickbar, Inc., Southport, Conn.

Filed Apr. 24, 1979, Ser. No. 32,748
Int. Cl.³ E02B *15/04*
U.S. Cl. 405—70 **7 Claims**



1. A tension transmitting connector for the end of a flat vertically arrayed fin of an elongated floating material containment boom, for joining said end thereof to a tension-applying towing or anchoring plate or to the juxtaposed end of a similar boom, comprising:

A. a vertically elongated central tow flange portion juxtaposed to said flat fin end and incorporated a distal engaging portion for interlocking engagement with the adjacent distal towing plate or anchoring plate of an adjacent connector, wherein the engaging portion comprises a raked, tension-carrying scarph jaw forming a scarph joint interlocking the tow flange with a mating scarph jaw of a tow flange of the adjacent connector;

B. two intermediate vertically elongated sidewall portions extending laterally divergingly from the central flange portion to define an enlarged vertical central cavity embracing the vertical fin end and reconverging to form facing proximal end flanges sandwiching the fin end therebetween in a narrow vertical proximal entrance portal slot; and

c. a vertically elongated anchoring core positioned inside the central cavity co-acting with the fin end and blocking its withdrawal through the portal slot.

4,295,757

JET SLED SPOIL SCOOP APPARATUS

Randal Gaspar, P.O. Box 2352, Morgan City, La. 70380

Filed Aug. 23, 1979, Ser. No. 68,919
Int. Cl.³ E02F *5/02*; F16L *1/04*
U.S. Cl. 405—163 **11 Claims**

1. A pipe burying apparatus comprising:

a. a frame;

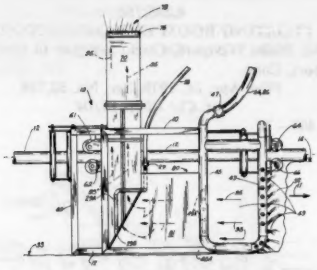
b. means on said frame adapting said frame for undersea towing;

c. left and right jetting means on said frame for cutting at least the left and right side walls of an undersea pipe trench as said frame is towed;

d. left and right air lift conduit means, each providing spoil intake and spoil discharge portions for removing soil cuttings from the trench cut by said jetting means, said spoil intake portions being placed generally behind and between said left and right jetting means;

e. spoil collection scoop means surrounding said spoil intake portions on at least four sides including at least the rear side thereof for collecting soil cuttings about said spoil intake portions of said left and right air lift conduit means, said spoil collection means having independently movable

rear and bottom door portions which move to a first open position to allow placement of said frame about a pipeline



to be buried, and subsequent closure of said rear and bottom door portions after said frame is placed about a pipeline to be buried.

4,295,758

WORKING PLATFORM FOR OIL DRILLING OPERATIONS IN ICE COVERED SEA AREAS

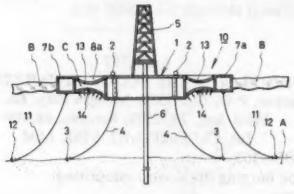
Nobuyoshi Yashima, Funabashi, Japan, assignor to Mitsui Engineering and Shipbuilding Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1979, Ser. No. 97,933

Claims priority, application Japan, Nov. 30, 1978, 53-148875; Nov. 30, 1978, 53-14876

Int. Cl.³ E02D *17/00*

U.S. Cl. 405—201 **13 Claims**



1. A working platform for oil drilling operations in ice-covered sea areas, said working platform comprising a platform means floating on the surface of the sea-water, oil drilling equipment mounted on said platform means, an oil drilling pipe extending from said oil drilling equipment to the bottom of said sea, a buoyant floating frame disposed around said platform means such that said frame is spaced from said platform means, said frame enclosing the surface of the sea water surrounding said drilling pipe, wherein said frame has sufficient strength to withstand the pressure of the ice and is movable in accordance with the movements of the ice, and heat insulating means for heat insulating the surface of the sea-water inside of said floating frame and is between said frame and said platform means.

4,295,759

DEVICE FOR THE CONTROL OF THE INTERNAL PRESSURE IN A DRILL PIPE FOR THE CONSTRUCTION OF FOOTINGS

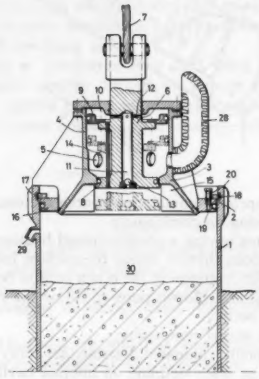
Hans Mathieu, and Jürgen Hochstrasser, both of Saarbrücken, Fed. Rep. of Germany, assignors to Elisabeth Hochstrasser geb. Wack and Jürgen Hochstrasser, both of, Fed. Rep. of Germany

Filed Feb. 4, 1980, Ser. No. 118,504

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2905042

Int. Cl.³ E02D *15/04*

U.S. Cl. 405—243 **9 Claims**



1. Device for the control of the internal pressure in a drill pipe for the construction of footings especially of compressed concrete footings with a valve, which valve is located in a lid, which lid serves for the tight seal of the drill pipe, which valve is equipped with venting holes, which valve is subjected to the internal pressure of the drill pipe in the direction of closing, which valve is subjected to a counterpressure, the effective power of which counterpressure is greater than the effective power of the internal pressure and where a hoisting cable is connected to the valve stem, the power of which hoisting cable is adjustable in the closing direction, and the power of which hoisting cable under normal operating conditions in combination with the internal pressure of the drill pipe is large enough to overcome the counterpressure, and where the valve shaft is equipped with a valve hat of a smaller diameter, which valve hat serves to seal the inner space of the drill pipe, and where the valve shaft is further equipped with a ring-shaped piston of larger diameter, which ring-shaped piston forms a counterpressure chamber with the valve housing, and where the counterpressure chamber is connected with the inside of the drill pipe by means of a drilled hole, which drilled hole is axially located in the valve shaft, and which drilled hole extends through the valve hat, characterized by the fact that a check valve (**13**) is located in the axial drilled hole (**11**) and that a parallel line (**14**) is provided which extends through the valve hat (**8**) and the ring-shaped piston (**9**), and which parallel line constitutes a restrictor.

4,295,760

ROCK BOLT ANCHOR

Clifford C. Warner, 7381 Bryant St., Westminster, Colo. 80030

Continuation-in-part of Ser. No. 898,632, Apr. 21, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 86,994

Int. Cl.³ E21D *21/00*; F16B *13/04*

U.S. Cl. 405—259 **19 Claims**

1. A rock bolt anchor, comprising:

a head of a diameter to fit within a borehole in rock;

a stem connected to said head and extending axially therefrom, said head extending laterally beyond said stem;

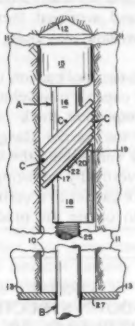
a foot connected to said stem opposite said head, said foot having a lateral dimension less than said head and an inclined surface spaced from said head but comprising a surface of said foot nearest said head, said surface being inclined with respect to the axis of said anchor;

a longitudinal hole in said head, said hole being provided with threads for engaging corresponding threads of a bolt by which said anchor may be moved into said borehole in said rock, said bolt extending through said foot and said stem;

a series of adjoining cam discs surrounding said stem and having a width less than the diameter of said borehole and a length greater than the diameter of said borehole, said cam discs having apertures therein permitting said discs to surround said stem and engaging said inclined surface of said foot in an angular position on said foot during movement of said anchor into said borehole, said stem having a length sufficient to accomodate said angular position of said cam discs;

said anchor being movable into said borehole by said bolt with said cam discs in said angular position to a predetermined point in said borehole;

said anchor being rotatable with said bolt at a sufficient speed to cause said ends of said discs to engage the wall of said borehole and terminate rotation of said discs; and



said inclined surface of said foot being constructed so as to then be engageable with the disc remote from said head to terminate rotation of said head and permit said bolt to thread through said head and said head then retracted by rotation of said bolt, whereby said head engages said cam discs and forces the ends thereof outwardly into the rock of said borehole to restrain further downward movement of said anchor.

14. A method of installing a rock bolt anchor in a borehole in rock, comprising:

mounting a series of adjoining cam discs on a foot having an inclined surface and surrounding a stem connecting said foot and a head of a diameter to fit within said borehole;

said stem extending axially from said head and said inclined surface being spaced from said head but comprising a surface of said foot having an apex nearest said head, said surface being inclined with respect to the axis of said anchor;

said head having a longitudinal hole provided with threads for engaging corresponding threads of a bolt by which said anchor is moved into said borehole in said rock, said bolt extending through said foot and said stem;

said cam discs having a width less than the diameter of said borehole and a length greater than the diameter of said borehole, said cam discs having apertures therein permitting said discs to surround said stem and engaging said inclined surface of said foot in an angular position on said foot during movement of said anchor into said borehole, said stem having a length sufficient to accommodate said angular position of said cam discs;

moving said anchor into said borehole by said bolt with said cam discs in said angular position to a predetermined point in said borehole; and

rotating said bolt at a sufficient rate to cause said cam discs to begin movement toward a position perpendicular to the axis of said bolt and thereby cause the ends of said cam discs to engage the wall of said borehole and terminate rotation of said cam discs, whereby further rotation of said foot causes said apex of said inclined surface to engage the cam disc remote from said head and reduce rotation of said head, thereby permitting said bolt to thread into said head and draw said head into engagement with said cam discs to force the ends thereof outwardly into the rock of said borehole.

4,295,761

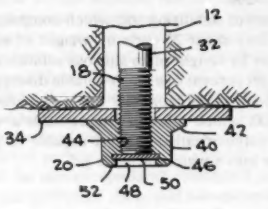
POST TENSIONABLE GROUTED ANCHOR ASSEMBLY

Roger M. Hansen, Birmingham, Ala., assignor to Stratabolt Corporation, Pelham, Ala.

Filed Dec. 10, 1979, Ser. No. 101,723

Int. Cl.[3] **E21D** *20/02*

U.S. Cl. 405—261 **9 Claims**



1. A post tensionable rock and mine roof anchor and nut assembly of the grouted or resin anchored type to be installed in a bore hole in a mine roof rock formation or the like and tensioned after mixing and setting of the grouting or resin for strengthening the same, comprising an elongated anchor including a generally cylindrical portion at its upper end having a shorter length than the depth of the bore hole in which it is to be fitted and having an elongated externally threaded rod portion at its lower end adapted to project a predetermined short distance externally of the bore hole when the anchor is normally positioned in substantially fully inserted condition in the bore hole, an internally threaded nut member to threadably receive the threaded rod portion therein providing companion thread surfaces forming a screw thread coupling assembling said nut member and anchor together and said nut member having an end surface to exert bearing force against the face of the rock formation, the anchor being adapted to be introduced into the bore hole in assembled relation with the nut member after insertion of a destructible cartridge containing quick-setting adhesive resin or grouting material therein to crush the cartridge and mix and distribute the resin or grouting material throughout the space outwardly surrounding most of the anchor and fixing the anchor in the bore hole upon hardening of such material thereabout, the nut member having a bore therethrough including a first smaller diameter bore portion extending from said end surface through a major portion of the axial depth of the nut member threaded to mate with the threads of the external threaded rod portion and having a second enlarged diameter bore portion forming the exit end of the bore communicating with the first bore portion, a disc seated in the second bore portion, and inwardly crimped lip formations integral with the nut surrounding the exit end of the bore and inwardly lapping the periphery of the disc in said second bore portion to retain the disc therein in position to bar penetration of the anchor rod portion through the nut until a predetermined torque force level is exceeded, the nut member being

initially assembled in threaded relation with the threaded rod portion of the anchor to occupy an initial assembled position wherein the disc restrains relative rotation of the nut member with respect to the anchor until said predetermined torque force level is exceeded, and said crimped lip formations releasing the disc and accommodating further threaded insertion of the rod portion through the bore of the nut when the anchor is restrained against rotation by setting of the adhesive resin or grouting material and torque force in excess of the predetermined torque force level is applied to the nut member.

4,295,762

GROUTING-SOIL CONDITIONING SYSTEMS USING POLYOXYETHYLENE DIACRYLATES

Manuel Slovinsky, Woodridge, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 13,105, Feb. 21, 1979, abandoned. This application Sep. 18, 1980, Ser. No. 188,185

Int. Cl.³ C09K *17/00*

U.S. Cl. 405—264 **10 Claims**

1. A process of stabilizing soil which comprises contacting from about 3 to about 20 parts by weight of such soil with about one part by weight of an aqueous solution containing at least 0.5 weight percent of a water-soluble diacrylate ester of a polyoxyalkylene glycol monomer having a molecular weight of at least 300, which solution also contains a water-soluble free radical polymerization catalyst capable of polymerizing the monomer into a water-insoluble gel.

4,295,763

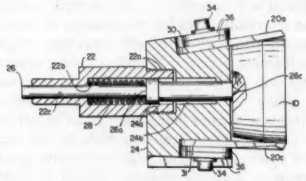
PLUG CUTTER

James J. Cunniff, 46 Lynnrich Dr., Thomaston, Conn. 06787

Continuation-in-part of Ser. No. 960,603, Nov. 14, 1978, abandoned. This application May 29, 1979, Ser. No. 43,364

Int. Cl.³ B27C *5/00*

U.S. Cl. 408—86 **17 Claims**



1. A plug cutter adapted for use in a drill press or the like, said cutter comprising

a holder having one portion adapted to be held for rotation on an axis coincident with the spindle of a drill press, and a second portion defining at least two symmetrically arranged sets of sockets with lands of each set circumaxially spaced and oriented at the same angle to said axis, each set having lands oriented at different angles with respect to said axis,

cutting blades with portions adapted to be received in said sockets and having projecting portions extending beyond said holder in parallel relationship to said lands to produce a multitapered plug, and

means for securing said blades in said sockets.

4,295,764

MOBILE MACHINE FOR REMOVING SURFACE IRREGULARITIES FROM RAIL HEADS

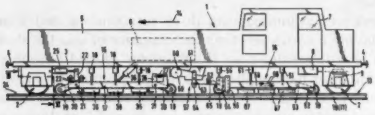
Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 11, 1978, Ser. No. 968,264

Claims priority, application Austria, Dec. 30, 1977, 9451/77

Int. Cl.³ B23D *1/10;* **B24B** *23/00;* **B23D** *7/06*

U.S. Cl. 409—296 **18 Claims**



1. A mobile machine mounted on a track having two rails including heads and the machine being arranged for advancement along the track for removing irregularities from the surfaces of the rail heads to a predetermined depth, which comprises

(a) a machine frame,

(b) an elongated tool carrier extending in a plane substantially parallel to the track and rigidly resistant to bending out of said plane, and vertically adjustably mounted on the machine frame and arranged thereon for vertical and lateral guidance without play along a respective one of the track rails,

(c) a cutter head on the tool carrier, the cutter head having

(1) a cutting tool capable of machining the surface of the head of the respective track rail continuously upon advance of the tool carrier along the track rail, and

(d) a hydraulic jack unit linking the tool carrier to the machine frame for vertically adjusting the tool carrier and subjecting the tool carrier to a vertically directed loading force sufficient to obtain the predetermined machining depth.

4,295,765

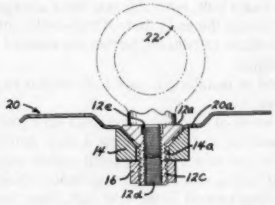
TIE-DOWN STRUCTURE

Michael R. Burke, 1017 Poplar Ct., Mt. Carmel, Ill. 62863

Filed Apr. 23, 1979, Ser. No. 32,551

Int. Cl.³ A62B *35/00;* **B61D** *45/00*

U.S. Cl. 410—101 **6 Claims**



1. A tie-down structure comprising a body member having a head with a top wall and an outwardly flaring side wall and a threaded stem, said threaded stem adapted to extend through an opening formed in a supporting surface, and a plug member and threaded means disposed on said threaded stem on a side of said supporting surface opposite to that of said head, said plug member freely movable on said threaded stem of said body member and having an outwardly flaring inner wall complementary in shape to said outwardly flaring side wall of said head and said threaded means in a stopping relationship therewith, where said top wall of said head is substantially flush

with a deformed portion of said opening in said supporting surface at an installed position.

4,295,766

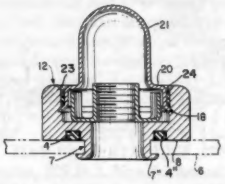
SELF-ALIGNING DOME NUT

Francis Shaw, Old House Landing and Bianca Rd., East Hampton, N.Y. 11937

Continuation-in-part of Ser. No. 928,542, Jul. 27, 1978, abandoned. This application Jan. 25, 1979, Ser. No. 6,667

Int. Cl.³ F16B *37/14, 39/00*

U.S. Cl. 411—113 **17 Claims**



1. A self-aligning dome nut comprising:

(a) a base member having:

(1) a neck portion extending from one side thereof for attachment into an aperture of a support member with at least part of the one side of said base member resting directly on the support member,

(2) a hole extending through said neck portion in the direction of the extension thereof, and

(3) a cavity in the other side of the base member in communication with the hole in the neck portion;

(b) a nut member loosely positioned within said cavity and in adjustable alignment with the hole in said neck portion, said nut being held against extended rotation within the cavity; and

(c) a protective covering dome enclosing said cavity and covering the nut member, said dome having an open end connected to the base member radially inwardly of its outer periphery to leave generally the entire other side of the base member available for direct application of a clamping force during attachment of the dome nut to the support member, the available portion being in alignment with the part of the one side of the base member resting directly on the support member.

11. A lightning-safe connection between a self-aligning dome nut and a support member comprising:

(a) an electrically conductive support member having an aperture therethrough;

(b) a dome nut including:

(1) an electrically conductive base member having:

(i) a neck portion extending from one side thereof and secured in the aperture of the support member with the one side of said base member facing the support member,

(ii) a hole extending through said neck portion in the direction of extension thereof, and

(iii) a cavity in the other side of the base member in communication with the hole in the neck portion,

(2) a nut member loosely positioned within said cavity and in adjustable alignment with the hole in said neck portion, said nut being held against extended rotation within the cavity, and

(3) a protective covering dome enclosing said cavity and covering the nut member, said dome having an open end connected to the base member; and

(c) a non-conductive insulating washer disposed around said neck portion and between the one side of the base member and the underlying side of the support member, said washer being dimensioned to electrically isolate the base member from the radially surrounding area of the underlying support member by a distance sufficient to prevent electrical arcing therebetween from an electrical discharge passing through the base member from the other side of said support member.

4,295,767

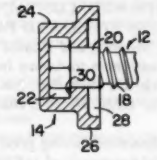
CORROSION RESISTANT FASTENER

John W. Temple, Jr., Box 43, Signal Mountain, Tenn. 37377

Filed Nov. 26, 1979, Ser. No. 97,361

Int. Cl.³ F16B *27/00*

U.S. Cl. 411—377 **7 Claims**



1. A corrosion resistant screw-type fastener comprising a ferrous metal body having an axially extending shank with external threads and a retaining head, said retaining head having a cylindrical portion adjacent said threads and a retaining portion adjacent said cylindrical portion remote from said threads, said retaining portion having a larger radial cross-sectional configuration than that of said cylindrical portion, a non-ferrous metal head fixedly disposed in engagement with and encapsulating the retaining portion and an adjacent part of the cylindrical portion, said non-ferrous head having an axially depending skirt spaced radially from the non-encapsulated part of the cylindrical portion to define an annular recess between the skirt and the non-encapsulated cylindrical portion, and a disk shaped seal positioned about said non-encapsulated, cylindrical portion wholly within the circumferential confines of said recess and extending partly outside the axial confines of said recess.

4,295,768

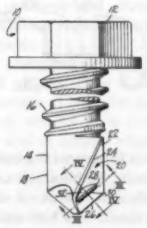
CHIP BREAKER SCREWS

Edwin J. Skierski, Campbellsville, Ky., assignor to USM Corporation, Farmington, Conn.

Filed Sep. 21, 1979, Ser. No. 77,664

Int. Cl.³ F16B *25/00*

U.S. Cl. 411—387 **8 Claims**



1. A drilling and thread-forming screw comprising a threaded shank and a pilot end disposed on a common centerline, a pair of flutes extending longitudinally of said pilot end to provide a pair of cutting surfaces disposed substantially parallel to a common plane and a pair of drag surfaces substantially perpendicular to said cutting surfaces, each of said cutting surfaces terminating at a cutting edge forming an angle with said common centerline, each of said cutting surfaces further having disposed thereon a discrete chip breaker in the form of a truncated cylindrical element having its cylindrical centerline substantially perpendicular to said cutting edge, and an end surface having an arcuate periphery, said surface forming

an angle greater than 90° with said cutting surface to thereby form a ramp to direct a continuous chip formed by said cutting surface away from said surface to form a small radius of curvature and thereby cause breakage of the chip, said chip breaker being spaced from the edges of said cutting surface, including said cutting edge whereby the configuration of said pilot end is substantially unchanged by the addition of said discrete chip breaker.

4,295,769

COPPER AND NITROGEN CONTAINING AUSTENITIC STAINLESS STEEL AND FASTENER

Joseph A. Douthett, Moaroe, and Ronald H. Espy, West Chester, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Feb. 28, 1980, Ser. No. 125,551

Int. Cl.³ C22C *38/16*; F16B *53/06*

U.S. Cl. 411—411 **8 Claims**

1. Austenitic stainless steel having good hot working properties, a 0.2% offset yield strength of 165 to 182 ksi and an elongation in 5 cm of at least 10% if cold reduced 60%, said steel consisting essentially of, in weight percent, 0.05% maximum carbon, 1.5% to 3.0% manganese, about 0.06% maximum phosphorus, about 0.035% maximum sulfur, about 1% maximum silicon, about 15% to about 20% chromium, 3% to 4.7% nickel, 1.75% to 3% copper, 0.10% to 0.30% nitrogen, up to about 0.3% columbium, titanium, tantalum or mixtures thereof, and balance essentially iron, said steel having an austenite stability factor ranging between about 30 and about 33 calculated by the formula $30\times\%C+\%Mn+\%Cr+\%Ni+\%Cu+30\times\%N$.

4. The steel claimed in claim **1** in the form of cold headed fasteners fabricated from 60% cold reduced wire.

4,295,770

HOOKBOLT ADAPTER

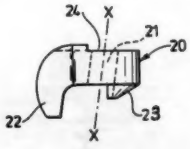
Gordon H. S. Alderton, Bingley, England, assignor to Henry Lindsay Limited, Shipley, England

Filed Oct. 11, 1979, Ser. No. 83,831

Claims priority, application United Kingdom, Oct. 16, 1978, 40653/78

Int. Cl.³ F16B *43/02*

U.S. Cl. 411—531 **8 Claims**



1. A hookbolt adapter for use with a bolt in order to convert the latter into a hookbolt, the hookbolt comprising:

a member having therein a hole of circular cross-section through which a shank of a bolt can be taken, said hole having an entrance thereto and a wall;

a nose portion and a tail portion of said member diametrically opposed to one another with respect to said hole;

a support surface of said member surrounding said entrance to said hole to be engaged by a head or by a nut of a bolt, said hole having an axis which is slightly inclined to a line perpendicular to said support surface; and

two diametrically opposed substantially semi-circular contact portions of said member provided on said wall of said hole and each associated with a respective one of said nose portion and said tail portion, said contact portions being made of malleable material so as to allow a bolt to take-up a position in which the axis of such a bolt will extend substantially perpendicular to said support surface and such a bolt will be held rigidly with the hookbolt adapter by said contact portions.

4,295,771

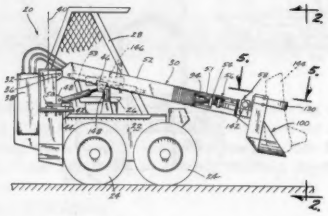
PORTABLE LOAD HANDLING APPARATUS

Thomas C. Mehesan, Jr., Hospers, Iowa, assignor to Banner Industries, Inc., Hospers, Iowa

Filed Aug. 20, 1979, Ser. No. 68,201

Int. Cl.³ B60P *3/00*; B65G *61/00*

U.S. Cl. 414—5 **9 Claims**



1. A load handling apparatus comprising,

a movable vehicle including a frame,

an elongated boom arm having opposite end portions,

means for operatively connecting said boom arm to said frame for pivotal movement about a first generally horizontal axis and a first generally vertical axis,

primary power means connected to said boom arm and frame for pivotally moving said boom arm about said first horizontal axis and first vertical axis,

said boom arm being longitudinally extendable and retractable for movement of one end portion toward and away from said first horizontal axis and said primary power means including means for longitudinally extending and retracting said boom arm,

a load support member,

wrist means interconnecting said load support member and said one end portion of said boom arm for pivotal movement of said load support member adjacent said one end portion of said boom arm and about first and second axes disposed generally perpendicular to one another and to the longitudinal centerline of said boom arm,

means for supporting said wrist means on said one end portion of said boom arm for pivotal movement of said wrist means about a third axis disposed generally parallel to the longitudinal centerline of said boom arm,

secondary power means connected to said wrist means for pivotally moving said load support member about said first and second axes and for pivotally moving said wrist means about said third axis, and

control means for selectively actuating said primary and secondary power means for movement of at least one of said boom arm and load support member about at least a selected one of said axes, said control means including

an elongated control arm having opposite ends,

means for connecting said control arm to said frame for pivotal movement about a second generally horizontal axis and a second generally vertical axis,

means for extending and retracting said control arm for movement of said one end toward and away from said second horizontal axis,

means for actuating said primary power means to pivotally move said boom arm about said first horizontal axis and first vertical axis in response to pivotal movement of the control arm about the second horizontal axis and second vertical axis respectively and means for actuating said primary power means to longitudinally extend and retract said boom arm in response to extension and retraction of said control arm such that said boom arm follows the movements of said control arm,

a control handle operatively connected to said one end of said control arm with freedom of pivotal movement of at least a portion of said handle about fourth and fifth axes disposed generally perpendicular to one another and to the longitudinal centerline of said control arm,

means for supporting said control handle on said one end of said control arm for pivotal movement of said control handle about a sixth axis disposed generally parallel to the longitudinal centerline of said control arm, and

means for actuating said secondary power means to pivotally move said load support member about said first and second axes in response to pivotal movement of at least said portion of the control handle about said fourth and fifth axes respectively and to pivotally move said wrist means about said third axis in response to pivotal movement of said control handle about said sixth axis such that said load support member follows the movements of said control handle.

4,295,772

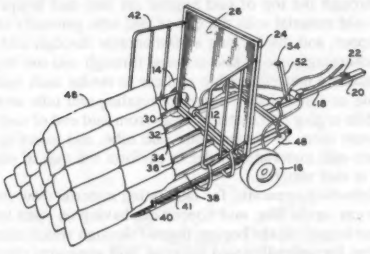
HAY BALE STACKER

Lawrence Zimmerman, R.F.D 2, New Richmond, Wis. 54017

Filed May 7, 1980, Ser. No. 147,463

Int. Cl.³ A01D *87/12*; B65G *57/28*

U.S. Cl. 414—38 **8 Claims**



1. A tiltable device for stacking bales behind a hay baler and for lifting and transporting stacks of bales so formed comprising in combination,

(a) a trailer assembly comprising an axle provided with wheels at each end and a hitch unit attached thereto adapted to be attached to a towing vehicle;

(b) a bale carrying bed of generally "L" shaped cross-section pivotably attached to said axle, said bed being attached to said axle at a point on the forward leg of said "L", spaced from the junction of said legs a distance which is less than the radius of said wheels; the angle between the legs of said "L" being greater than 90°,

(c) the more forward leg of said "L" forming a platform suitable to support a standing person and being equipped with side rails,

(d) the rearward leg of said "L" comprising a plurality of bale supporting tines adapted to support a stack of bales manually assembled there-against, the extremities of said tines on said rearward leg adapted to touch the ground on pivoting of said assembly, and

(e) means for pivoting said assembly about said axle.

4,295,773

APPARATUS AND METHOD FOR INTRODUCING SOLIDS INTO A SOLIDS UPFLOW VESSEL

Roland O. Dhondt, Long Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Nov. 9, 1979, Ser. No. 92,688

Int. Cl.³ C10B *31/02*

U.S. Cl. 414—187 **24 Claims**

1. An apparatus for introducing particulate solids upwardly into a solids upflow vessel having a bottom solids inlet. which comprises:

a stationary feed cylinder mounted below said upflow vessel in coaxial alignment with said solids inlet, said feed cylinder having a substantially solids-tight upper cylindrical section of a preselected height and a lower cylindrical section having at least one solids inlet opening;

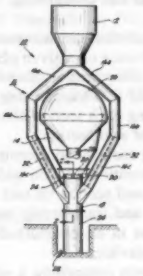
at least one solids feed chute mounted adjacent said upflow vessel and having a discharge end communicating with said feed cylinder through said inlet opening, said feed chute having an inlet end communicating with an elevated feed reservoir and being adapted to transport particulate solids from said feed reservoir into said lower section by mechanically unassisted gravity flow through said feed chute;

a piston movably mounted in said feed cylinder for vertical reciprocation along the common axis of said feed cylinder and said solids inlet;

piston actuator means for reciprocating said piston along said common axis;

backflow prevention means interposed between said feed cylinder and said solids inlet, said backflow prevention means being adapted to prohibit backflow of solids from said upflow vessel during the filling of said feed cylinder and to allow displacement of solids from said feed cylinder upwardly through said solids inlet; and

sealing means for sealing the inlet opening of said feed cylinder during the displacement of said solids into said upflow vessel.



12. A method for transporting particulate solids from an elevated solids feed reservoir and introducing said solids upwardly into a solids upflow vessel having a bottom solids inlet, said method comprising:

(a) transporting a charge of particulate solids by mechanically unassisted gravity flow from said feed reservoir downwardly through at least one solids feed chute into a lower cylindrical section of a stationary feed cylinder mounted below and in coaxial alignment with said solids inlet, said feed cylinder being fitted with a piston axially reciprocatable among at least three piston positions along the common axis of said feed cylinder and said solids inlet;

(b) extending said piston from a lowermost first piston position upwardly to a second piston position so as to displace said charge of particulate solids from said lower section upwardly into a substantially solids-tight upper cylindrical section of said feed cylinder;

(c) communicating said upper section of said feed cylinder with said solids inlet;

(d) thereafter further extending said piston upwardly to an uppermost third piston position so as to displace substantially all of said charge of particulate solids upwardly into said solids upflow vessel;

(e) thereafter positioning a backflow prevention element directly below said solids inlet so as to prevent backflow of said solids downwardly through said solids inlet; and

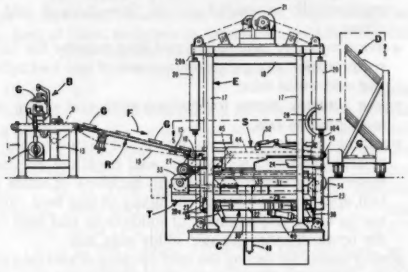
(f) retracting said piston to said first piston position.

4,295,774

APPARATUS FOR AUTOMATICALLY TURNING OVER AND FOR STORING SECTIONS OF ELASTOMERIC MATERIAL

Silvio Manini, and Antonio Pacciarini, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milano, Italy

Continuation of Ser. No. 825,764, Aug. 18, 1977, which is a division of Ser. No. 577,459, May 14, 1975, Pat. No. 4,062,458. This application Jul. 26, 1979, Ser. No. 61,047
Claims priority, application Italy, Jun. 28, 1974, 24491 A/74
Int. Cl.[3] B65G 1/00
U.S. Cl. 414—331 9 Claims



1. An apparatus for handling sections of elastomeric material having first and second side comprising:

a frame;

a first transporting device and a means for receiving said sections which advance on a given plane and according to a stated direction along the line of arrival, and for transferring them onto said first transporting device;

means for overturning each section about an axis parallel to one of said sides of said section;

means for collecting each section coming from a first given direction and for positioning it on said overturning means;

means for blocking said section on said overturning means;

means for releasing and transferring said section from said overturning means in an overturned position onto said first transporting device;

said overturning means comprising a substantially cylindrical member mounted on said frame and rotatable about its substantially horizontal longitudinal axis;

said collecting means comprising at least one supporting surface for said section, obtained by means of two planes mating together along a side parallel to said longitudinal axis of the cylindrical member and having a length equal to that of said cylindrical member, said two planes forming together an obtuse angle having its concavity directed towards the outside of said cylindrical member, said supporting surface defining a portion of the peripheral surface of said cylindrical member;

said blocking means comprising pliers for blocking the sections, having one end pivoted to said cylindrical member along a second axis arranged parallel to the side common to the two planes, and of such a shape whereby the other end of said pliers upon rotation of said second axis contacts said side common to the two planes at the side of the concavity;

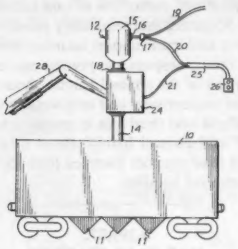
said transferring means comprising first and second rollers rotatably mounted on said frame and a first system of laterally spaced conveyor belts wound about said first and second rollers, said system of belts defining a transport plane situated below said cylinder, said rollers being defined with respect to the direction of motion of the plane as a front roller and a back roller respectively, the motion of said transport plane taking place from the front to the back roller, said belts and pliers being situated so that said pliers are situated at the spaces between said conveyor belts.

4,295,775

UNLOADER FOR HOPPER CARS AND METHOD

William P. Cottrill, Tampa, Fla., and Andrew J. Cisternino, Atlanta, Ga., assignors to Evacuators, Inc., Tampa, Fla.

Filed Oct. 9, 1979, Ser. No. 82,963
Int. Cl.[3] B65G 67/24
U.S. Cl. 414—375 7 Claims



2. A method for unloading material from a hopper car or the like wherein said material is normally flowable and is packed, which retards such flowing, said method including the steps of opening the gate to one hopper of said hopper car, placing a tube through the top of said hopper car into said hopper car and in said material with the end of said tube generally at said one hopper, and discharging a blast aerator through said tube for discharging some of said material through said one hopper and fluidizing material within said car to render such material flowable, and including the steps of rotating said tube about its axis while urging said material away from said end of said tube to prevent entry of material into said tube, and inserting said tube into said material in order to perform the step of placing a tube in said material.

4. Unloading apparatus for facilitating material flow from a hopper car or the like, said hopper car having an open top, at least one hopper on the bottom thereof through which material is to flow for unloading said material, said apparatus comprising a housing disposable over said open top of said hopper car, a tube rotatably carried by said housing and depending therefrom, said tube being of sufficient length to extend from said housing through said material generally to said hopper of said hopper car, a blast aerator receivable on said housing in communication with said tube, and means for discharging said blast aerator through said tube, and including seal means fixed to said housing, said seal means rotatably receiving said tube in one end thereof, said seal means communicating with said blast aerator at the other end thereof, and further including a tip carried by said tube, said tip including a plurality of flanges disposed across the lower end of said tube generally radially of said tube and pointed at their lowermost ends, said flanges converging to a common point.

4,295,776

PORTABLE INVERTER FOR TRANSFERRING BULK GOODS BETWEEN PALLETS

Alan Payne, Poplar Lodge, Beeston, Kings Lynn, Norfolk, and Robin G. Bunning, Willow House, Gressenhall, East Dereham, Norfolk, both of England

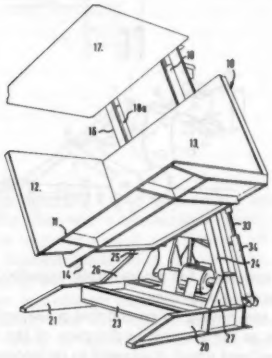
Continuation of Ser. No. 945,278, Sep. 25, 1978, abandoned. This application Aug. 20, 1980, Ser. No. 179,869
Int. Cl.[3] B65G 7/00
U.S. Cl. 414—405 4 Claims

1. A free-standing, portable palletized load inverter for transferring bulk goods, packed in a plurality of sacks, boxes and the like and supported on a first generally rectangular pallet, to a second similar pallet, said palletized load inverter comprising:

a unitary, three-sided load platform of sheet metal adapted to be selectively rotated as a unit between an upright attitude and an inverted attitude, said load platform when in its

said upright attitude being adapted to receive and support bulk goods stacked onto the first pallet, said load platform including a sheet metal floor constituting one side of said three-sided platform onto which the first pallet can be placed, a sheet metal side wall constituting a second side of said three-sided platform for retaining the stacked bulk goods resting against it, said sheet metal side wall being disposed at substantially right angles to said floor and being located in abutment with one end edge of said floor, and a sheet metal rear wall constituting the third side of said platform and disposed at substantially right angles to said floor and side wall, said rear wall having edges which are in abutment with edges of said floor and side wall and having a length corresponding to that of said floor and a height corresponding to that of said side wall, and said sheet metal floor, side wall and rear wall being fixedly attached to one another at their abutting edges respectively in a unitary configuration which defines a three-sided load receiving region and which is rotatable as a unit between said upright and inverted attitudes, said rear wall being longer than said side wall so that the first pallet can be loaded widthwise onto the load platform from the front thereof;

a plurality of intersecting horizontal and transverse reinforcing ribs attached to said floor, to said side wall, and to said rear wall on the faces thereof which are remote from said



three-sided load receiving region, at least some of said ribs extending across said faces at positions thereon inward of the boundary edges of said faces;

means defining a slideway on said rear wall directed parallel to the rear wall at right angles to said floor;

a sliding member in said slideway which slideably supports a sheet metal lid projecting therefrom in overlying relation to said three-sided load receiving region and in spaced parallel relationship to said sheet metal floor for rotation as a unit with said load platform and for movement along a line normal to the plane of said floor, said lid also having intersecting reinforcing ribs attached to the face thereof remote from said load receiving region, said lid being adapted in the said inverted attitude of the load platform to support the second pallet which had previously been placed in said load platform, when said load platform was in its said upright attitude, with the load accepting surface of the second pallet resting on the top of the said bulk goods;

hydraulic ram actuating means connected directly between said load platform and said lid and operative to selectively extend said lid away from said floor while said load platform is in its said upright attitude to allow the first and second pallets to be loaded into said load platform, and said actuating means also being operative selectively to retract said lid towards said floor to engage the base of the second pallet after the first and second pallets and the said bulk goods therebetween have been loaded into said load platform;

a stand having a rotatable shaft mounted thereon and affixed to said sheet metal rear wall for supporting the load platform rotatably above ground level, said stand including a ground-contacting base which extends underneath the load platform to provide stable support therefor and an upstanding support frame for the load platform, said ground-contacting base having at least one structural portion thereof location above ground level and adapted to receive the forks of a fork lift truck in lifting engagement therewith for moving said load transfer device from one location to another; and

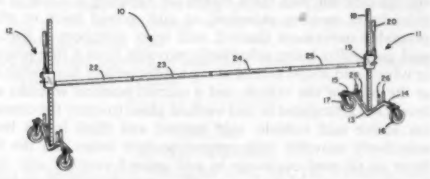
means in driving engagement with said rotatable shaft for selectively rotating said load platform between its said upright attitude and its said inverted attitude, the direction of rotation being such that said rib reinforced side wall supports said bulk goods during the rotation of said load platform from its said upright attitude into its said inverted attitude.

4,295,777

ROLL LIFTING DOLLIES

Dwain C. Bell, 1400 Marshall St. NE., Minneapolis, Minn. 55413, and Lloyd E. Anderson, 6408-74th Ave. North, Minneapolis, Minn. 55428

Filed Oct. 6, 1980, Ser. No. 194,619
Int. Cl.³ B60P *3/00*
U.S. Cl. 414—458 **2 Claims**



1. Lifting apparatus comprising, in combination:

(A) first and second jack assemblies each comprising

(a) an elongated frame member having first and second caster wheels supported on the undersurface and at opposite ends thereof;

(b) a jack shaft affixed to the upper surface of said frame member generally midway between said opposite ends and extending perpendicularly to said upper surface of said frame members;

(c) a jack runner mounted on said jack shaft for reciprocal motion therealong upon operation of a jack handle;

(d) a stub member of a predetermined length affixed to said jack runner and extending generally perpendicularly to the longitudinal axis to said jack shaft;

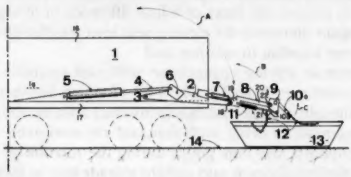
(B) an elongated tubular member coupled between the stub member on said first jack assembly and the stub member on said second jack assembly, said tubular member comprising a plurality of tubular sections coupled end-to-end and further including a plurality of relatively short stem elements connected to at least one of said frame members, projecting generally parallel to said jack shaft, said stem elements having a diameter to telescopically receive one or more of said tubular segments for storage when not in use.

4,295,778

APPARATUS FOR LIFTING WASTE CONTAINERS ON TO TRUCKS

Claude Hergaux, 6 & 8 Rue de l'Avenir, 76120 Grand Quevilly, France

Filed Dec. 13, 1978, Ser. No. 969,072
Claims priority, application France, Mar. 17, 1978, 78 08249
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—525 R **8 Claims**



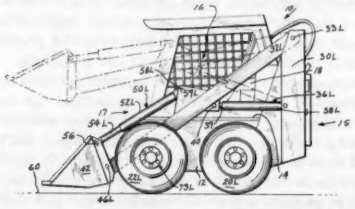
1. Apparatus for unloading the contents of a relatively large waste container onto a vehicle comprising a lifting assembly located on each side of said vehicle, each of said assemblies comprising a first elongated lever member pivotably mounted at one end to said vehicle and extending along the side of the vehicle for pivotable movement in a generally vertical plane; first means mounted on said vehicle for applying a force to said first lever member to effect pivotable movement thereof; a second elongated lever member carried at one end by the extended end of said first lever member for movement conjointly therewith in said vertical plane and for pivotable movement relative thereto; second means for applying a force to said second lever member mounted on said first lever member to effect pivotable movement thereof: a third lever member carried on the extended end of said second lever member for conjoint movement therewith in said vertical plane and also for pivotable movement relative thereto, said third lever member including means for supporting at least two chains or cables in spaced relation; and third means for applying a force to said third lever member mounted on said second lever to effect pivotable movement thereof, said lever members in each of said assemblies being selectively movable from a first position in which said levers extend along a substantially horizontal axis at the sides of the vehicle and a second position wherein said levers are articulated in said vertical plane to carry the containers above said vehicle, said second and third levers being selectively movable with respect to each other and the first lever to tilt said container in said second position said third lever being movable in an arc sufficient to invert said container beyond the vehicle.

4,295,779

STRAIGHT ARM LOADER

John F. Shumaker, Mt. Pleasant, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 8, 1980, Ser. No. 138,331
Int. Cl.³ E02F *3/70*
U.S. Cl. 414—685 **7 Claims**



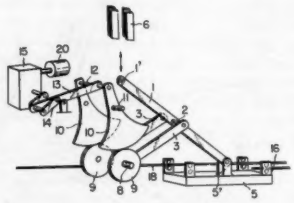
1. A loader comprising: a frame having a rearwardly disposed support member; a material handling element disposed adjacent the front end of said frame; a pair of substantially straight lift arms disposed on opposite sides of said frame, each lift arm is pivotally joined at one end to said support member and at the opposite end to said material handling element; means, interconnecting said frame and at least one lift arm, for moving said lift arms between a raised and a lowered position; and wheel means for movably supporting said frame relative to the ground, said wheel means defining two channels at the front end of said frame adapted to receive said lift arms in their lowered position.

4,295,780

APPARATUS FOR AUTOMATICALLY TRANSFERRING WORKPIECES

Yoshimasa Wada, 2411 Ietomi-cho, Ashikaga-shi, Tochigi-ken; Sigeki Yamazaki, 382-36 Oaza-Takabayashi; Isamu Kobayashi, 837 Dainosato, both of Ota-shi, Gunma-ken; Noriyuki Haraguchi, 2-3717 Sakae-cho, Ashikaga-shi, Tochigi-ken, and Minoru Fukuda, 1048 Ishihara, Ota-shi, Gunma-ken, all of Japan

Filed Jul. 6, 1979, Ser. No. 55,167
Claims priority, application Japan, Sep. 24, 1978, 53-117008
Int. Cl.³ B65G *47/34*
U.S. Cl. 414—749 **4 Claims**



1. An apparatus for automatically transferring workpieces, said apparatus comprising;

a long arm having a first end that is adapted to reciprocally move in the lengthwise direction of the apparatus and a second end which is adapted to reciprocate in a direction perpendicular to the movement direction of said first end;

a carriage mounted on said first end for movement together therewith;

a guide for engaging and guiding said second end of said long arm only in an end position thereof remote from the path of said first end;

a pair of short arms having a length equal to one half of the length of said long arm and disposed in each side of said long arm, one end of each said short arm being pivotally mounted on said long arm at the midpoint thereof and the other end of each said short arm being pivotally located at each side of a crossing point of the movement path of said first end of said long arm and the movement path of said second end of said long arm; and

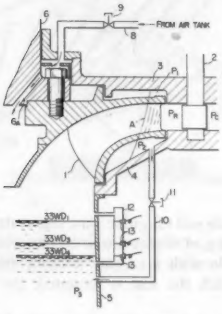
a combination crank mechanism and transmission means adapted to oscillate each said short arm about said other end thereof, the second end of said long arm being adapted to move out of engagement with said guide in order to oscillate each said short arm in an angular range up to about 180° from one direction of the movement path of said first end of said long arm to the opposite direction of the same by means of said crank mechanism, both said long arm and said short arms being disposed in the same direction and in a common plane at each stroke end to thereby enable highly smooth carriage movements and accurate positioning thereof at each stroke end.

4,295,781

METHOD FOR OPERATING FLUID MACHINES IN SPINNING-IN-AIR MODE

Kenzyu Ogiwara; Minoru Kawada, and Teiji Ashida, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Service Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Jun. 22, 1979, Ser. No. 51,173
Claims priority, application Japan, Jul. 21, 1978, 53-88401
Int. Cl.³ F01D *17/00, 19/00*
U.S. Cl. 415—1 9 Claims



1. A method for operating a fluid machine in a spinning-in-air mode in synchronism with a transmission system, wherein the fluid machine includes a serial arrangement of working fluid inlet valve, closeable guide vanes, runner within a runner chamber of a casing and draft pipe, so as to define a water retaining chamber immediately adjacent the outer peripheral portion of the runner that will tend to retain water during rotation of the runner in spinning-in-air mode and further includes a leak-water exhaust valve in a pipe having an inlet in the water retaining chamber and a discharge in the draft tube, comprising the steps of:

with the runner drivingly connected in synchronism with the system and drivingly connected with a rotary machine having power to rotate the runner, and with the runner operating under no load with the inlet valve and guide vanes open and passing working fluid toward and through the runner, closing the guide vanes to shut off the flow of working fluid through the runner;

thereafter feeding compressed air to the runner chamber to fill the runner chamber within the casing with compressed air and lower the working fluid level in the draft pipe below the runner while continuing rotating the runner in synchronism so that the runner is rotating primarily in compressed air with working fluid remaining in the water retaining chamber between the runner and closeable guide vanes and closing the inlet valve; and

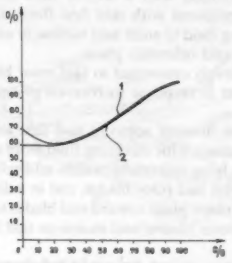
thereafter opening the leak-water exhaust valve to simultaneously pass the water from the water retaining chamber directly to the draft tube while bypassing the runner, which such opening being conducted after the inlet valve has closed and the pressure within the water retaining chamber substantially equals the pressure within the draft tube while maintaining the synchronized rotational speed of the runner so as to prevent excess rise of water within the draft pipe.

4,295,782

STARTING OF PUMPS OR TURBOPUMPS

Pierre Boussuges, Grenoble, France, assignor to Neyrpic, Grenoble, France

Filed Oct. 19, 1979, Ser. No. 86,675
Claims priority, application France, Oct. 20, 1978, 78 29899
Int. Cl.³ F03B *3/10*
U.S. Cl. 415—1 2 Claims



1. A method of starting pumps with immersed wheels, said pumps being of the type with a fixed distributor-diffuser, and according to which the curve of variation of the power at working speed as a function of the flow of fluid passes through a minimum which is between the zero-flow point and the operating point, wherein the method comprises the following sequence:

putting the pumps into rotation, at a speed lower than operating speed of the motor of the pump with a flow valve closed,

when the pressure on either side of the said flow valve has reached a differential value which is sufficiently low for its opening to be effected without risk of damage, opening said flow valve to such an extent that it allows, when the unit approaches its operating speed, the flow corresponding to the said minimum of the curve of power-flow at operating speed, and

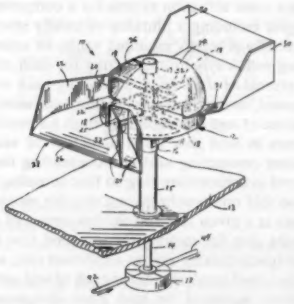
progressively opening of said flow valve until it allows the operating flow to pass.

4,295,783

FLUID TURBINE

Barry A. Lebost, 1116 Warburton Ave., Apt. 1K, Yonkers, N.Y. 10701

Filed Feb. 9, 1978, Ser. No. 876,217
Int. Cl.³ F03D *1/04*
U.S. Cl. 415—2 R 25 Claims



1. A fluid turbine for generating power when disposed in a free flowing fluid, comprising

a rotor means including

a housing, and

a plurality of rotor blades within said housing adapted to rotate in a reference plane about a longitudinal axis when exposed to said free flowing fluid,

said housing being provided with a first fluid entrance passage therein for allowing fluid to enter said turbine in a direction lying within said reference plane to engage at least certain ones of said rotor blades, said housing being further provided with a second fluid entrance passage therein contiguous with said first fluid entrance passage for allowing fluid to enter said turbine in another direction oblique to said reference plane,

means operatively connected to said rotor blades for generating power in response to rotation of said rotor blades, and

means on said housing adjacent said first and second fluid entrance passages for directing fluid from said passages in a direction lying essentially within said reference plane to impinge upon said rotor blades, and in a direction oblique to said reference plane toward said blades to impinge upon all of said rotor blades, said means on said housing including

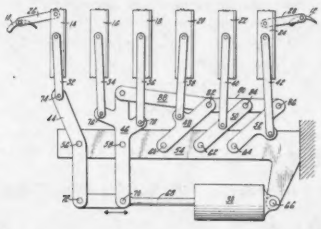
side wall means spaced from said reference plane and inclined with respect to said longitudinal axis, said side wall means extending at least approximately two quandrants around the rotational path of said rotor blades to provide a space adjacent said rotor blades for producing spiral flow of fluid within said housing and between said wall means adjacent said rotor blades.

4,295,784

VARIABLE STATOR

Frank B. Manning, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 26, 1979, Ser. No. 78,980
Int. Cl.³ F01D *17/16*
U.S. Cl. 415—162 **4 Claims**



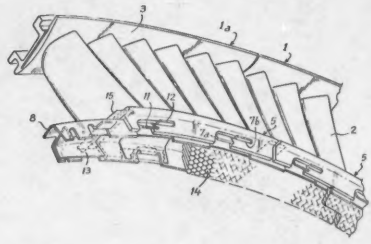
1. A stator vane actuation system for a compressor of a gas turbine engine including a plurality of axially spaced rows of circumferentially pivotally mounted vanes, an actuator having a connecting rod, a synchronizing ring for each row of vanes mounted external of the engine connecting each vane for pivotal movement, means interconnecting said connecting rod and at least one of said synchronizing rings for positioning each of said vanes in said row upon actuation of said actuator, linkage means connecting said interconnecting means and at least a second synchronizing ring so that actuating said actuator positions said one synchronizing ring for moving said one row of vanes at a given rate and the movement of said second synchronizing ring for moving the attached row of vanes to said second synchronizing ring at a different rate, a fixed elongated member, bell crank means for each of said synchronizing rings pivotally mounted on said fixed elongated member, means interconnecting said bell crank and said synchronizing rings, the bell crank means actuating said one synchronizing ring and the bell crank means actuating said second synchronizing ring being disposed at respectively different angles relative to said elongated member.

4,295,785

REMOVABLE SEALING GASKET FOR DISTRIBUTOR SEGMENTS OF A JET ENGINE

Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Mar. 18, 1980, Ser. No. 131,459
Claims priority, application France, Mar. 27, 1979, 79 07590
Int. Cl.³ F01D *11/02*
U.S. Cl. 415—174 **8 Claims**



1. In a removable seal for guide vane segments of a jet engine wherein a plurality of blades are interconnected by an outer ferrule engageable with a turbine housing and by an inner ferrule upon which the seal is mounted, the improvement comprising:

said seal being mounted in an inwardly facing channel-shaped member removably attached to said inner ferrule, said inner ferrule being an inwardly facing channel-shaped member having, in its outer sides, a plurality of L-shaped recesses each having a leg opening radially inwardly to the inner edge of said outer sides and a circumferentially extending leg, said recesses being engaged by locking tongues on said channel-shaped member.

4,295,786

COMPOSITE SEAL FOR TURBOMACHINERY

Robert C. Bill, Rocky River, and Lawrence P. Ludwig, Fairview Park, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

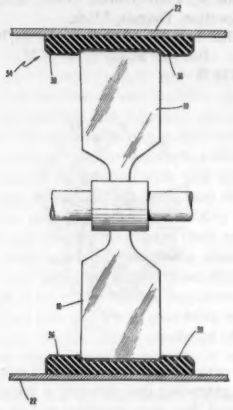
Division of Ser. No. 931,090, Aug. 8, 1978, Pat. No. 4,207,024, which is a division of Ser. No. 801,290, May 27, 1977, Pat. No. 4,135,851. This application Nov. 20, 1979, Ser. No. 96,255
Int. Cl.³ F01D *11/08*
U.S. Cl. 415—174 **10 Claims**

1. A gas path seal for a turbine or the like having a plurality of blades mounted for rotation about an axis comprising

a stator shroud having an aerodynamic smooth surface on a thin layer of a deformable metallic material that is wearable relative to said blades and closely spaced to the blade tips whereby said shroud is deformed when said blades rub against said surface,

a yieldingly deformable porous backing surrounding said layer to receive said deformed shroud thereby reducing said blade wear by limiting the magnitude of normal

forces measured radially inward which are developed between the blade tips and the shroud, and



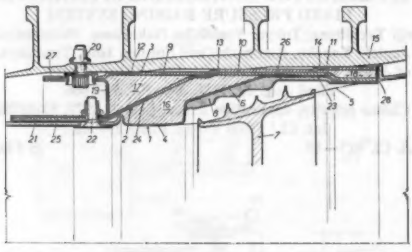
a rigid mounting housing surrounding said backing and being secured to the outermost surface of said backing.

4,295,787

REMOVABLE SUPPORT FOR THE SEALING LINING OF THE CASING OF JET ENGINE BLOWERS

Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Mar. 21, 1980, Ser. No. 132,642
Claims priority, application France, Mar. 30, 1979, 79 08583
Int. Cl.³ F04D *29/54;* F01D *11/08*
U.S. Cl. 415—197 **7 Claims**



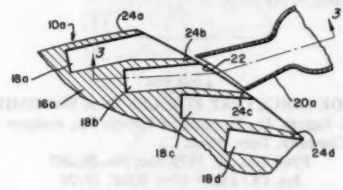
1. In a removable support for sealing linings in the blower casings of jet engines, the casing being at least partially attached to acoustic panels, the improvement comprising: at least two concentric ferrules; an inner ferrule having a part of its internal surface conforming to the flow of the air stream and the other part extending over a zone covered by blades of a rotor, said inner ferrule supporting a lining, an outer ferrule being provided on its external surface with cylindrical surfaces adapted to engage surfaces provided on the internal surface of the casing by means of force fitting, the space between the two ferrules being filled with a filler material, and at least one ferrule of U-shaped cross section, connecting the two concentric ferrules at their ends, with the integral part of the outer ferrule receiving securing means, which immobilize said support against rotation relative to the casing.

4,295,788

TURBINE WHEEL AND NOZZLE ARRANGEMENT

Jules L. Dussourd, Princeton, and George W. Pfannebecker, Skillman, both of N.J., assignors to Terry Corporation, Windsor, Conn.

Filed Mar. 10, 1980, Ser. No. 129,038
Int. Cl.³ F01D *9/02*
U.S. Cl. 415—202 **2 Claims**



1. An improved milled-bucket turbine wheel and nozzle arrangement, for a machine comprising:

a milled-bucket turbine wheel mounted for rotation; and

an energized-fluid-discharging nozzle mounted in adjacency to the periphery of said wheel, for discharging energized fluid onto said periphery; wherein

said wheel has a plurality of substantially parallel, arcuate buckets formed in, and in traverse of, the periphery thereof; and

said nozzle has a fluid-exit orifice opening onto, and in aligned registry with a given side portion or area of said periphery whereat there subsist lateral terminations of said buckets; wherein the improvement comprises:

said buckets are substantially semicircular in cross-section, having a given radius; and

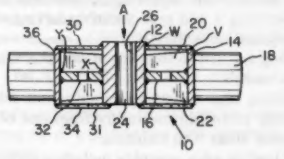
said orifice has a width, measured along a plane traversin said wheel periphery, which is not less than approximately fifteen and one third percent, nor more than approximately eighteen and one fifth percent of twice said given radius.

4,295,789

COVER PLATES FOR TANK HEADS

Howard L. Gutzwiller, Zelienople, Pa., assignor to Robinson Industries, Inc., Zelienople, Pa.

Filed Aug. 9, 1979, Ser. No. 65,122
Int. Cl.³ F04D *29/18, 29/32*
U.S. Cl. 416—213 A **4 Claims**



1. An axial flow fan comprising:

A. a hub having a central axis;

B. an annular rim concentrically positioned and spaced from the hub;

C. a disc extending normal to the central axis substantially midway of the hub and connecting the hub to the rim said disc being a structural member providing the primary structural support for the rim;

D. a plurality of blades, each blade extending outward from the rim and angularly disposed thereto to form a leading and trailing edge;

E. first and second reinforcement plates extending radially

outward in opposite directions and spaced from and along the central axis, said plates welded to the hub, disc and rim, said first plate extending subjacent the leading edge of each blade and said second plate extending subjacent the trailing edge; and

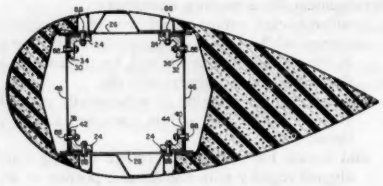
F. a pair of nonstructural disc-shaped cover plates, each plate welded to the hub and to a terminal edge of the annular rim, wherein said nonstructural cover plates protect structural members, is sacrificial in relation thereto and is accessible and refurbishable in the field.

4,295,790

BLADE STRUCTURE FOR USE IN A WINDMILL

Walter S. Eggert, Jr., Huntington Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Jun. 21, 1979, Ser. No. 50,687
Int. Cl.³ F03D *1/06;* B64C *11/26*
U.S. Cl. 416—226 **10 Claims**



1. A tapered blade structure for use in a windmill including a spar assembly extending the full length of said blade structure and twisted along its length to a predetermined angle and having leading and trailing edge assemblies attached thereto comprising:

(a) top and bottom spaced flat tapered elongated longitudinally extending metal sheets,

(b) a pair of tapered angle metal strip elements secured to each of said extending sheets along opposite longitudinal edges thereof,

(c) a plurality of relatively short pairs of flat metal shear web channels secured to said angle strip elements between said top and bottom sheets along the length of said sheets,

(d) said tapered angle strip elements extending from the inner end of said blade structure towards the tip of said blade structure more than one-half and less than the length of said blade structure,

(e) said metal sheets, tapered strip elements, and web channels forming a said spar assembly having a substantially rectangular cross-section,

(f) a fitting secured to the ends of said sheets and said shear web channels,

(g) a leading edge assembly secured to one side of said spar assembly extending outwardly from one of said pairs of flat metal shear web channels,

(h) said leading edge assembly including an outer fiberglass plastic sheet having edge portions extending partly over said top and bottom flat tapered metal sheets,

(i) a reinforcing plate bonded to said fiberglass plastic sheet to prevent impact damage,

(j) a trailing edge assembly secured to the side opposite said one side of said spar assembly extending outwardly from the other of said pairs of flat metal shear web channels, and

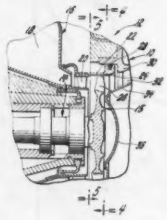
(k) said trailing edge assembly including top and bottom fiberglass sheets each having edge portions extending partly over said top and bottom flat tapered metal sheets to join the edge portions of said outer fiberglass plastic sheet of said leading edge assembly.

4,295,791

SCALLOPED CERAMIC TURBINE

Jesse F. Johnson, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1979, Ser. No. 67,797
Int. Cl.³ F01D *5/14, 5/28*
U.S. Cl. 416—241 B **1 Claim**



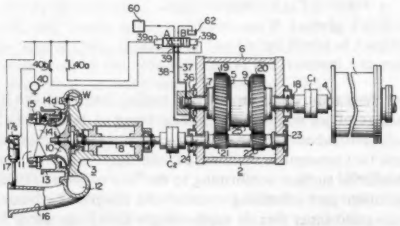
1. A unitary ceramic gas turbine wheel comprising: a hub with a radially extending disc thereon, a wheel rim having a plurality of spaced, fore face segments and an aft face, a neck integrally joining said wheel rim to said disc, a plurality of blades with roots integrally joined to said rim at the outer surface thereof, each of said blades having a leading edge and a trailing edge, concave convex airfoil surfaces joining said leading and trailing edges, said wheel rim having an axial length less than that of said blade roots, each of said blades having its leading edge located upstream of said fore faces and being joined to said neck and fore faces by a faired root region, said faired root regions and said fore faces on said rim forming scallops in said wheel between each of said leading edges to reduce differential thermal expansion strain at the leading edges to prevent excessive therma! stress concentrations in said blades and wherein said scallops further are configured to reduce the polar movement of inertia of said turbine wheel to improve the acceleration characteristics thereof.

4,295,792

APPARATUS FOR CONTROLLING OPERATION OF FLUID PRESSURE RAISING SYSTEM

Keiji Tachibana, Tokyo; Yoshihiko Nakayama, Shimoinayoshi; Junichi Kaneko, Amimachi, and Susumu Ishii, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1978, Ser. No. 937,806
Claims priority, application Japan, Sep. 9, 1977, 52-107830
Int. Cl.³ F04B *49/00;* F16D *25/063*
U.S. Cl. 417—15 **25 Claims**



1. An apparatus for controlling the operation of a fluid pressure raising system including at least a motor having a constant rotational speed and a centrifugal fluid machine connected to said motor, said centrifugal fluid machine including a casing provided with a suction passage and a discharge passage, inlet guide vanes disposed in said suction passage, an impeller shaft connected to said motor and rotatably mounted in said casing and at least one impeller carried by said impeller

shaft, so that a fluid may be sucked through said suction passage and pressurized by said impeller as said impeller is driven by said motor and then discharged through said discharge passage, said apparatus comprising:

an overdrive gear having a variable overdrive ratio and disposed between said motor and said centrifugal fluid machine, said overdrive gear including a gear box, a driven shaft connected to said impeller shaft of said centrifugal fluid machine and rotatably carried by said gear box, at least two pinions having different numbers of gear teeth and carried by said driven shaft, a drive shaft extending substantially in parallel with said driven shaft and rotatably carried by said gear box, said drive shaft being connected to said motor, gears rotatably carried by said drive shaft and adapted to engage their respective corresponding pinions, and clutch means adapted to connect selected one of said gears to said drive shaft, whereby said driven shaft is rotated at least at two overdrive ratios of a set overdrive ratio and a low overdrive ratio;

detecting means for detecting a condition of said fluid pressure raising system to produce a signal representative of said condition; and

an actuator for actuating said clutch means in response to said signal delivered by said detecting means,

said fluid pressure raising system further includes a condenser having an inlet communicating said discharge passage and an outlet, and an evaporator having an inlet communicating said outlet of said condenser and an outlet communicating said suction passage, and

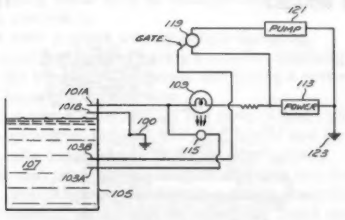
wherein said detecting means detects the pressure at said inlet of said condenser.

4,295,793

FLUID SENSITIVE SWITCHING CONTROLLER

James D. McGalliard, 11171 Fenwick Pl., Santa Ana, Calif. 92705

Filed Nov. 6, 1978, Ser. No. 958,143
Int. Cl.³ F04B *49/06*
U.S. Cl. 417—36 **2 Claims**



1. A device for controlling the level of fluid in a container comprising:

a first fluid probe;

a second fluid probe;

a unitary light source;

a unitary light sensor illuminated by said unitary light source;

means for initiating illumination of said unitary light source when one of said probes contacts said fluid, regardless of the conductive state of said unitary light sensor;

means responsive to said unitary light sensor for maintaining illumination of said unitary light source whenever said sensor is illuminated and the other of said probes contacts said fluid; and

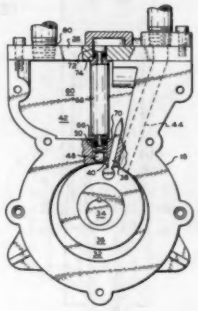
means for controlling the level of fluid in said container, said means being connected in series with said sensor.

4,295,794

SELECTIVE MODE MULTI-STAGE VACUUM PUMP

Robert L. Cain, Bryan, Ohio, assignor to Robinair Manufacturing Corporation, Montpelier, Ohio

Filed Jan. 22, 1979, Ser. No. 5,604
Int. Cl.³ F04B *23/04*
U.S. Cl. 417—62 **2 Claims**



1. In a rotary vacuum pump having a pair of pump casings each having a pumping chamber defined therein housing a rotary displacer, an electric motor in driving connection with said displacers, an inlet defined in each of said casings in communication with the associated chamber, an oil reservoir defined in each of said casings above the associated chamber, an outlet passage interconnecting the chamber and reservoir of a common casing, a single head superimposed upon said casings enclosing the reservoirs thereof, the improvement comprising a cross-over conduit mounted upon one of said pump casings within the oil reservoir thereof having a first end communicating with the outlet passage of said one casing and a second end communicating with a cross-over passage defined in said head, said conduit including sealing means adjacent said ends, said cross-over passage communicating with the inlet of the other pump casing whereby said cross-over conduit and passage establish a series interconnection between the pumping chambers of said casings, and an outlet port defined in said head in communication with said oil reservoir of said other casing.

4,295,795

METHOD FOR FORMING REMOTELY ACTUATED GAS LIFT SYSTEMS AND BALANCED VALVE SYSTEMS MADE THEREBY

John C. Gass, Wichita, Kans.; Noell C. Kerr, Liberty, and Robert W. Pittmann, Sugarland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 889,470, Mar. 23, 1978, abandoned. This application Jun. 11, 1979, Ser. No. 47,657
Int. Cl.³ F04F *1/20*; F16K *31/08*
U.S. Cl. 417—111 **5 Claims**

1. A remotely actuated gas lift system for improved efficiency in lifting oil in a production tube internally of a well casing comprising,

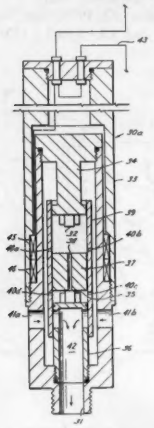
(a) remote valve control means at the surface,

(b) valve means having a magnetic core in the well responsive to said remote valve control means for being opened to eject casing fluid through a passage into the production tube for lifting the oil in the production tube and for being closed for stopping flow of casing fluid into the production tube,

(c) said valve means has means for equalizing the casing fluid pressure on both ends of said magnetic core for reducing resistance to movement and providing a balanced valve means requiring a minimum of energy for operation thereof, and

(d) said means for equalizing said casing fluid pressure on

both ends of said magnetic core comprising casing fluid passage means extending completely through said mag-



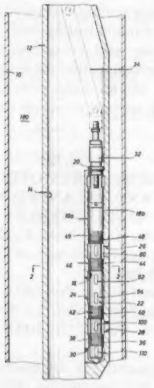
netic core for the length thereof for circulating casing fluids freely to both ends thereof.

4,295,796

GAS LIFT APPARATUS

Howard H. Moore, Houston, Tex., assignor to McMurry/-Hughes, Inc., Huntsville, Tex.

Filed Jun. 29, 1979, Ser. No. 53,302
Int. Cl.³ F04F *1/20*
U.S. Cl. 417—115 **18 Claims**



13. A gas lift valve assembly including a valve body having central longitudinal bore means, said valve body having a first lateral opening therethrough from said bore means, a second lateral opening therethrough from said bore means and longitudinally spaced from said first lateral opening, and a third lateral opening therethrough from said bore means disposed longitudinally between but spaced from said first and second lateral openings;

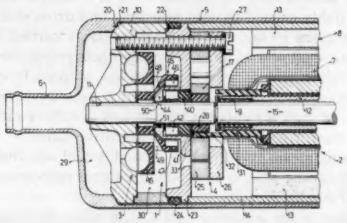
a first valve element movably mounted on said valve body for opening and closing said bore means between said first and third lateral openings; and a second valve element movably mounted on said valve body for opening and closing said bore means between said second and third lateral openings.

4,295,797

FUEL SUPPLY PUMP

Karl Ruhl, Gerlingen, and Ulrich Kemmner, Sachsenheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 932,388, Aug. 9, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,775
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1977, 2745818
Int. Cl.³ F02M *37/08*; F04B *23/14, 17/00*
U.S. Cl. 417—203 **13 Claims**



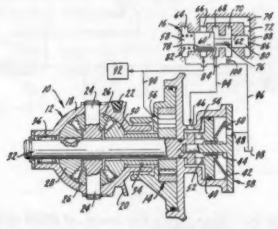
1. In a fuel supply pumping system arranged together with a driving electromotor in a common housing, said system including a first pumping stage, a second pumping stage, a first rotary coupling connection between said first and second pumping stages, and a second rotary coupling connection between said electromotor and one of said pumping stages, the improvement wherein said first rotary coupling includes oppositely extending hub portions, each hub portion being provided with a permanent magnet element, said permanent magnet elements together forming a magnetic coupling.

4,295,798

AUTOMATIC TWO-SPEED PUMP ASSEMBLY

Arthur M. McIntosh, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 1, 1979, Ser. No. 80,767
Int. Cl.³ F04B *35/00*
U.S. Cl. 417—212 **11 Claims**



1. An automatic two-speed pump assembly comprising a transmission shiftable to first and second operating modes, said transmission including fluid operated means movable between first and second positions for respectively shifting said transmission to said first and second modes, and means biasing said fluid operated means toward its first position; a pump engaged with said transmission so as to be driven thereby; and means operative in response to pump pressure for controlling the shift of said transmission from said first to said second mode at a first pump pressure and from said second to said first mode at a second pump pressure, said controlling means including valve means movable between first and second positions, said valve means in its first position communicating said fluid operated means with a fluid reservoir such that said fluid operated means is moved to its first position by said biasing means, and

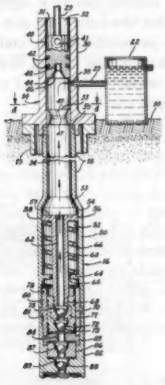
said valve means in its second position communicating said pump with said fluid operated means such that said fluid operated means is moved to its second position in opposition to said biasing means, said controlling means also including resilient means biasing said valve means toward its first position, said valve means defining a relatively small surface area subject to pump pressure when in its first position and a relatively large surface area subject to pump pressure when in its second position such that said valve means is movable from its first to its second position by a relatively high jump pressure and from its second to its first position by said resilient means in opposition to a relatively low pump pressure.

4,295,799

SONIC PRESSURE WAVE SURFACE OPERATED PUMP

Arthur P. Bentley, P.O. Box 1952, Roswell, N. Mex. 88201

Filed Nov. 8, 1978, Ser. No. 958,552
Int. Cl.³ F04B *47/12*
U.S. Cl. 417—240 **18 Claims**



1. A sonic pressure wave surface operated single tube pump for pumping liquid from an underground level to a ground surface comprising:

(a) a sonic pressure wave generator including,

I. a vertical cylinder having a bore for containing liquid in the lower portion thereof and having a port extending laterally from that bore,

II. a piston reciprocal in the bore of said cylinder for opening and closing the port thereof and for reciprocally impacting the liquid contained therein,

III. said piston having a liquid impacting end face with a central recess formed therein which generates a sonic pressure wave upon impacting the liquid containable therein,

IV. a sonic nozzle loçated in the lower portion of the bore of said vertical cylinder;

(b) a power operated drive means coupled to said piston for reciprocal driving thereof;

(c) a metallic tube having one of its ends coupled to the lower end of said cylinder, said tube having a bore formed therethrough for containing liquid with that bore in communication with the bore of said cylinder for receiving and transmitting the sonic pressure waves upon generation in said cylinder; and

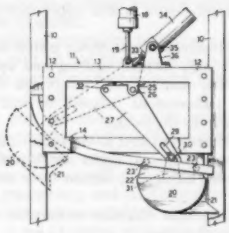
(d) pumping mechanism means connected to the other end of said tube and in communication with the liquid to be pumped, said pumping mechanism means including a reciprocally operable plunger for impingingly receiving the sonic pressure waves when transmitted by said tube and reflecting those waves into a centrally and upwardly moving column.

4,295,800

ENERGY CONVERTOR

Bernard A. Packer, 328 Duthie Ave., Rockhampton North, Queensland, 4701, Australia

Filed Sep. 4, 1979, Ser. No. 72,162
Claims priority, application Australia, Sep. 7, 1978, PD5859; Nov. 10, 1978, PD6730; Mar. 9, 1979, PD7983
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—333 **4 Claims**



1. In an energy conversion device of the type including:

a support frame;

a carriage member which is movable in an upward or downward direction relative to the support frame;

track means associated with said carriage member whereby the track means is orientated at an angle relative to the horizontal so as to define a downward location and an upward location, said track means being curved towards the upward location from the downward location, the radius of curvature decreasing from the downward location to the upward location; and

a float member movable on said track means from said downward location to said upward location due to pressure from ocean waves or swells whereby energy generated by movement of said float member may be converted to mechanical or other forms of energy; the improvement comprising: a pump means pivotally mounted on said carriage member, and linkage means pivotally attached to said pump means and to said float member.

4,295,801

FLUID-POWERED SUBMERSIBLE SAMPLING PUMP

Robert W. Bennett, 5116 Bonham, Amarillo, Tex. 79110

Filed Jul. 31, 1979, Ser. No. 62,364
Int. Cl.³ F04B *47/08*
U.S. Cl. 417—397 **25 Claims**

1. A fluid-powered sampling pump system comprising:

a tube bundle reel assembly;

a tube buhdle reeled upon said reel assembly and including:

a fluid sample tubing;

a power fluid charging tubing; and
an exhaust power fluid tubing;
a pump connected to one end of said tube bundle for lowering into the earth, said pump comprising:
a hollow cylindrical upper motor piston chamber defining an axially extending fluid passageway in the wall thereof for receiving pressurized power fluid from said power fluid charging tubing, and further defining an axially extending fluid passageway in the wall thereof for delivering exhaust power fluid to said exhaust power fluid tubing;
an upper motor piston in said upper motor piston chamber;
a hollow cylindrical lower motor piston chamber;
means detachably interconnecting said upper and lower motor piston chambers and positioned therebetween to facilitate independent removal of said motor piston chambers from the pump;
a lower motor piston in said lower motor piston chamber;
means interconnecting said upper and lower motor pistons for concurrent movement within their respective piston chambers;
a lower pump piston chamber connected to said lower motor piston chamber;
an upper pump piston chamber connected to said upper motor piston chamber;
an upper pump piston connected to said upper motor piston and having a portion positioned in said upper pump piston chamber for reciprocation therein during the concurrent reciprocation of said upper motor piston;
a lower pump piston having a portion positioned in said lower pump piston chamber and connected to said lower motor piston for reciprocation in said lower pump piston chamber when said lower motor piston undergoes reciprocation;
a lower pump valve subassembly connected to said lower pump piston chamber and including an intake valve and a discharge valve;
an upper pump valve subassembly connected to said upper pump piston chamber and including an intake valve and a discharge valve;
manifold tubing means commonly interconnecting said discharge valves to said fluid sample tubing of said tube bundle;
a pilot valve subassembly interposed between said upper and lower motor piston chambers and detachably mounted on said means interconnecting said upper and lower motor piston chambers;
a distribution valve subassembly interposed between said upper motor piston chamber and said lower motor piston chamber and detachably mounted on said means interconnecting said upper and lower motor piston chambers, said distribution valve subassembly being operatively connected to said pilot valve subassembly and to said motor pistons to respond to shifting movement of said pilot valve subassembly during operation of the pump, and to distribute power fluid to said motor pistons; and
means interconnecting said pilot valve subassembly and said distribution valve subassembly with said axial fluid passageways in said upper motor piston chamber.

4,295,802

VAPOR CONTROL SYSTEM

Norman Peschke, Kentwood, Mich., assignor to Dover Corporation, Grand Rapids, Mich.

Filed Jul. 2, 1979, Ser. No. 53,808
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—405 **7 Claims**

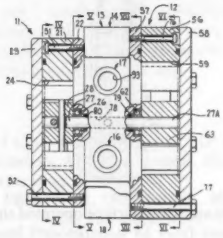
1. In an apparatus for withdrawing vapors from the zone adjacent the fill opening of a fuel tank, said apparatus having a motor-pump unit for association with a fuel conducting conduit and a vapor conducting conduit, the improvement comprising:

a central component defining a central housing having first and second enlarged end walls which face in opposite directions and are substantially parallel, said central housing being bounded by peripheral sidewall means;

said central housing having a fuel inlet port connectible to the fuel conduit and communicating with a first fuel passage which extends interiorly of the central housing and terminates in a first opening formed in said first end wall, and a fuel discharge port connectible to the fuel conduit and communicating with a second fuel passage which extends interiorly of said central housing and terminates in a second opening formed in said first end wall;

said central housing also including a vapor inlet port connectible to the vapor conduit and communicating with a first vapor passage which extends interiorly of said central housing and terminates in a third opening formed in said second end wall, and a vapor discharge port connectible to the vapor conduit and communicating with a second vapor passage which extends interiorly of said central housing and terminates in a fourth opening formed in said second end wall;

elongate shaft means rotatably supported on said central housing so that the rotational axis of said shaft means is substantially perpendicular to said first and second end walls, said shaft means having first and second end portions which respectively project outwardly beyond said first and second end walls;



a motor component connectible into the fuel-flow path for rotating or stopping as the fuel flows or stops flowing, respectively;

said motor component including a motor housing removably but fixedly attached to said central housing directly adjacent said first end wall, said motor housing having an elliptical central cavity, and a vane-carrying rotor rotatably mounted within said cavity and nonrotatably secured to the first end portion of said shaft means, said first and second openings respectively communicating with high and low pressure zones of said cavity adjacent said rotor;

a pump component drivingly connected for rotation with said motor component and introducible into the vapor flow path for creating a vapor withdrawing suction in said vapor conduit simultaneous with the flow of fuel in the fuel conduit;

said pump component comprising a pump housing removably and fixedly secured to said central housing adjacent said second end wall, said pump housing defining an elliptical central cavity, and a vane-carrying rotor rotatably mounted within said cavity, and nonrotatably secured to the second end portion of said shaft means, said third and fourth openings respectively communicating with low and high pressure zones within said pump cavity.

4,295,803

SEPARATING MACHINE

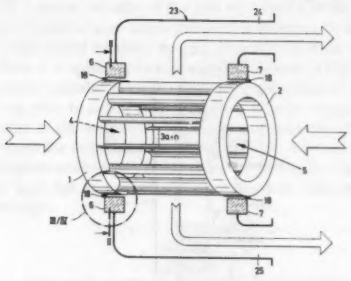
Ulrich Barthelmess, Niederstotzingen, Fed. Rep. of Germany, assignor to Omya GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,623

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825400

Int. Cl.³ F04B *17/00, 35/04*

U.S. Cl. 417—423 R 10 Claims



1. A flow machine for separating particles in a flowable medium, the machine having a rotor rotatably mounted in a housing, said rotor comprising two face rings spaced apart in the axial direction of the rotor and a plurality of blades extending axially therebetween, said rings being supported for rotation about their outer circumferences in the housing and at least one of the rings being driven, and an inlet and an outlet in the housing for flowable medium, said flowable medium being drawn through the flow machine so that it flows axially through the rotor and traverses the blades substantially radially as it flows between the inlet and the outlet effecting a separation of particles in the flowable medium.

4,295,804

INTERMEDIATELY COOLED AIR VACUUM PUMP WITH BALANCING OF THE PRESSURES

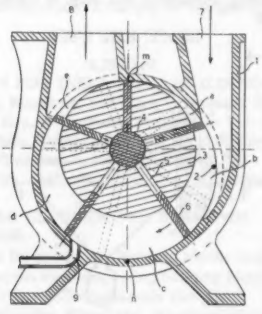
Adriano Pezzot, Via Udine, 8, 33094 Cordenons (Pordenone), Italy

Filed Jul. 5, 1979, Ser. No. 54,842

Claims priority, application Italy, Nov. 7, 1978, 83499 A/78

Int. Cl.³ F04C *18/00, 29/04*

U.S. Cl. 418—15 1 Claim



1. An improved pump apparatus of the type having a stator body with an internal chamber for suction and compression, an input port, an output port, an eccentrically mounted rotor located within the chamber, the rotor including a plurality of radial lamellae mounted thereon, the lamellae adapted to make contract with the inside of the chamber through the influence of centrifugal force, and passageway means for venting the chamber at the location where the chamber formed by adjacent lamellae has its largest volume, wherein the improvement comprises:

(a) the passageway means is positioned such that a first arc between the passageway means and the output port is as long as an arc between points at which adjacent lamellae contact the inside chamber including the thickness of one lamella;

(b) the output port subtends an angle as large as the arc between the points at which adjacent lamellae contact the inside of the chamber;

(c) the input port is positioned such that a second arc from the output port to the input port is as long as the arc between the points at which adjacent lamellae contact the inside of the chamber;

(d) the input port subtends an angle smaller than the arc between the points at which adjacent lamellae contact the inside of the chamber; and,

(e) the passageway is positioned such that a third arc between the passageway and the input port is as long as the arc between the points at which adjacent lamellae contact the inside of the chamber, including the thickness of one lamella,

whereby, as each succeeding chamber volume is swept past the passageway means and on toward the output port, there occurs no significant compression of fluid enclosed within such chamber.

4,295,805

HYDRAULIC ROTARY TOOTHED PISTON ENGINE WITH FLOW THROUGH THE TOOTHED GAPS

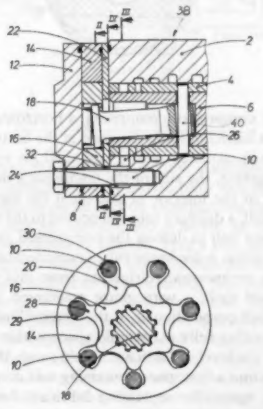
Karl-Heinz Liebert, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 12, 1979, Ser. No. 84,183

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1978, 2845648

Int. Cl.³ F03C *2/08;* F04C *2/10, 15/02*

U.S. Cl. 418—61 B 4 Claims



1. In a combined fluid displacing device (8) and control valve assembly having a radially outer ring gear (14) provided with internal teeth spaced from each other by gaps in fluid communication with fluid displacing pockets formed between said ring gear and an inner member (20), valve means a valve housing therefor (2) within which axial flow passages (24) are formed, a fixed spacer (22) positioned axially between the ring gear and the housing and elongated assembly fasteners (10) extending through the ring gear and the spacer into the valve housing through the axial flow passages therein, the improve-

ment residing in said ring gear being formed with radial extensions (28) of said gaps between the internal teeth receiving the fasteners therethrough with flow clearance in substantial axial alignment with the axial flow passages in the valve housing, said spacer being formed with axial flow openings (32) through which the fasteners extend with partial radial clearance to conduct axial flow between the radial gap extensions and the axial flow passages in the housing without directional change with the fluid flow being into and out of said fluid displacing pockets through said gaps, radial gap extensions, openings, axial flow passages and valve means.

4,295,806

ROTARY COMPRESSOR WITH WIRE GAUZE LUBRICANT SEPARATOR

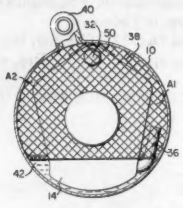
Naoki Tanaka, Amagasaki; Kunihiko Tsuchiya, and Toshizo Nishizawa, both of Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1979, Ser. No. 34,009

Claims priority, application Japan, May 26, 1978, 53/63088; Dec. 29, 1978, 53/179398[U]

Int. Cl.[3] F04C *29/02;* B01D *50/00*

U.S. Cl. 418—97 8 Claims



1. A rotary compressor comprising: a horizontal cylindrical shell having a lubricant sump disposed at the bottom thereof; a compressor unit mounted within said shell for compressing a gaseous refrigerant, the size of the compressor unit being less than the size of the interior of said shell for leaving a space within said shell; a delivery tube connected to the main body of said compressor unit to deliver the compressed gaseous refrigerant to said space; a discharge tube connected to said shell to discharge the compressed refrigerant from said space to the exterior of said shell; a wire gauze positioned in said space within said shell perpendicular to the longitudinal axis of said shell and extending fully across said space within said shell to a level below the level of lubricant in said sump, thereby dividing said space into a first space containing said compressor unit and a second space, for separating lubricant from the compressed refrigerant and for directing said separated lubricant back to said lubricant sump; and means in said first space for blocking passage of refrigerant between said compressor unit and said shell for dividing the first space into two portions, said delivery tube opening into one of said space portions and said discharge tube opening out of the other space portion, whereby compressed refrigerant is delivered from said delivery tube to said one space portion, passes through the wire guaze to the second space, and then again passes through the wire guaze to said other space portion and said discharge tube

4,295,807

INTERNAL COMBUSTION ENGINE WITH OIL PUMP GEAR SURROUNDING AND DRIVEN BY CRANKSHAFT

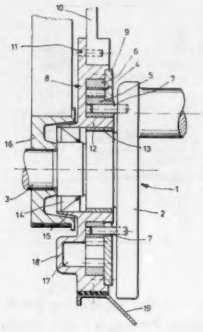
Hermann Krüger, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,475

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836766

Int. Cl.[3] F04C *2/10;* F04B *17/00;* F01M *1/02*

U.S. Cl. 418—170 8 Claims



1. In an internal combustion engine having a crankshaft mounted for rotation on at least one main crankshaft bearing and having a gear oil pump directly driven by said crankshaft and including at least one gear surrounding said crankshaft and rotationally driven by said crankshaft, the improvement wherein said gear also surrounds said main bearing and forms an operative gear of said pump whereby said bearing and said oil pump occupy common axial space on said crankshaft.

4,295,808

APPARATUS FOR THE PRODUCTION OF HIGH-PURITY METAL POWDER BY MEANS OF ELECTRON BEAM HEATING

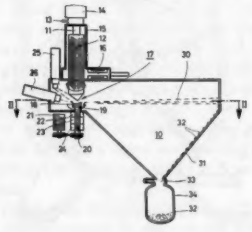
Herbert Stephan, Bruchköbel; Hans Aichert, Hanau am Main, and Joseph Heimerl, Altenhässlau, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Division of Ser. No. 902,475, May 7, 1978, Pat. No. 4,218,410, which is a continuation of Ser. No. 697,283, Jun. 17, 1976, abandoned. This application Oct. 15, 1979, Ser. No. 85,155

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528999

Int. Cl.[3] B22F *9/00*

U.S. Cl. 425—8 12 Claims



1. An apparatus for making high-purity metal powder from high purity metal while maintaining the initial high purity of the starting material, comprising:

a. a circular plate having a given diameter and a circumferential marginal area and means for rotating same at a high

speed about a vertical axis of rotation corresponding to the center of the plate;

b. means for electron beam melting high purity metal starting material in rod form in vacuo into molten metal droplets directed onto the circular plate;

c. means for producing an electron beam focusable to a given focal spot on the plate and for focusing the focal spot such that its diameter is many times smaller than the given diameter of the plate and deflecting the beam between the rotational center of the spinning plate and the marginal area to effect the scanning of the plate in a zone that extends radially of the axis of rotation of the plate to said marginal area when the plate is spinning to direct the molten metal droplets by centrifugal force from the plate when it is spinning in a controlled manner within a fixed narrow angular portion of the circumference of the spinning plate to define a fixed narrow angular range of flight paths of the molten metal droplets leaving the plate; and

d. means for collecting the metal particles formed from the droplets undergoing cooling and solidification due to loss of heat due to radiation during flight to form the metal powder.

4,295,809

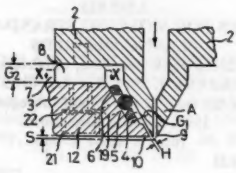
DIE FOR A MELT BLOWING PROCESS

Takashi Mikami; Shigeo Fujii; Shuji Okano, and Tokuzo Ikeda, all of Ooi, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1979, Ser. No. 75,816

Int. Cl.³ D01D *3/00*

U.S. Cl. 425—72 S **16 Claims**



1. An extrusion die assembly for a melt blowing process with a nose piece having a triangular cross-section and extrusion holes along the apex thereof, for extrusion of melted thermoplastic resin, said assembly having gas lips defining gas slots at either side of the apex and having movable spacers provided in the gas slots said spacers contacting said nose piece and said gas lips for determination of the gap of the gas slots.

4,295,810

APPARATUS FOR INSULATING BUILDING BLOCKS

Heinz Dennert, Bischberg, and Hans V. Dennert, Schlüsselfeld, both of Fed. Rep. of Germany, assignors to Veit Dennert KG Baustoffbetriebe, Schlüsselfeld, Fed. Rep. of Germany

Filed Jun. 5, 1979, Ser. No. 45,732

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825508

Int. Cl.³ B29C *27/30;* B29D *27/00*

U.S. Cl. 425—110 **11 Claims**

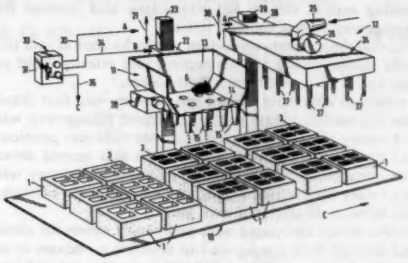
1. Apparatus for producing building blocks comprising

conveying means for transporting building blocks each having at least one hollow chamber therein,

a filling station for filling the chambers of said building blocks with particles of preformed thermoplastic synthetic material,

a fusing station for fusing the surfaces of said particles of thermoplastic synthetic material together, and

synchronizing means for controlling the movements of said conveying means, filling station and fusing station to fill the chambers of said building blocks with said particles of



thermoplastic synthetic material and then fuse said particles together.

4,295,811

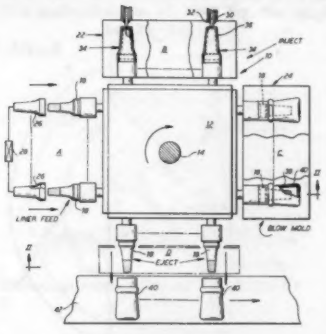
APPARATUS FOR MAKING MULTILAYERED CONTAINERS

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 608,177, Aug. 27, 1975, which is a division of Ser. No. 448,191, Mar. 5, 1974, abandoned. This application Jul. 19, 1979, Ser. No. 58,781

Int. Cl.³ B29C *17/07*

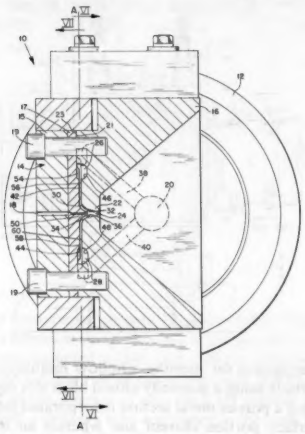
U.S. Cl. 425—112 **5 Claims**



1. In apparatus for forming a hollow multilayered thermoplastic article using a normally closed blow slot equipped core rod having a porous metal section incorporated into a forward outer surface portion thereof and wherein an internal fluid passageway longitudinally extends from a rear portion of said core rod to each of said blow slot and said porous metal section, said apparatus additionally including liner loading station means for loading a liner over said core rod, injection mold station means for forming a parison over said liner on said core rod to form a multilayered preform, blow mold station means for blow molding said preform on said core rod to form a blown article, blown article removal station means for removing said blown article from said core rod, core rod transfer means including rotary means and coacting stationary means for relatively moving said core rod between said liner loading station means, said injection mold station means, said blow mold station means and said removal station means, and control means for operating said core rod transfer means, said liner loading station means, said injection mold station means, said blow mold station means, and said blown article removal station means for producing a hollow multilayered thermoplastic article by injection blow molding, the improvement which comprises:

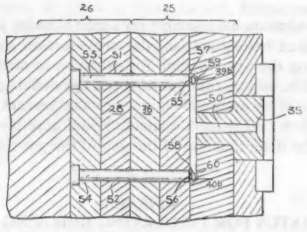
(A) means for opening and then closing said blow slot when said core rod is located functionally adjacent said blow station means,
(B) first detachable connection means, located at said liner loading station means, for connecting said internal fluid passageway with a vacuum source,
(C) second detachable connection means located at said blow mold station means for connecting said internal fluid passageway with a pressurized fluid source,
(D) means to effectuate connection between said first detachable connection means and said internal passageway when said rotary means has moved said core rods into position at said liner loading station and between said second detachable connection means and said internal passageway when said rotary means has moved said core rods into position at said blow mold station means, and
(E) valve means associated with said rotary means for closing said internal fluid passageway to maintain a vacuum in said liner loaded core rod during the period when (a) said internal fluid passageway is detached from said first detachable connection means, (b) said rotary means is advanced first to said injection mold station means and then to said blow mold station means, and (c) said second detatchable connection means is so connected with said internal fluid passageway.

4,295,812
RIBBON CABLE EXTRUSION CROSSHEAD
David C. Hoddinott, Preston, Conn., assignor to Crompton & Knowles Corporation, New York, N.Y.
Filed Jun. 18, 1980, Ser. No. 160,416
Int. Cl.[3] B29F *3/10*
U.S. Cl. 425—114 **8 Claims**



1. An extrusion crosshead for encapsulating a sheet of parallel co-planar conductor wires with plastic insulating material, said extrusion head comprising:
(a) an extrusion die having a plurality of interconnected extrusion passages dimensioned to accommodate the sheet of conductor wires, each extrusion passage having an inlet opening to receive a conductor wire;
(b) a guide-block having a plurality of holes axially aligned with the die passages for receiving the wires and guiding the wires to the die;
(c) an inlet bore for receiving plasticized insulating material from an extruder, the longitudinal axis of said bore being at an angle to the longitudinal axes of the extrusion passages extending through the die;
(d) an elongated top distribution channel extending above the full width of said sheet and having a longitudinal axis that is transverse to the longitudinal axes of the extrusion passages, said top distribution channel having an inlet opening at one end and an elongated outlet opening that extends at a downward angle from the inlet opening to the opposite end of the top distribution channel, the cross-sectional area of said top distribution channel gradually diminishing from the inlet opening to the opposite end thereof;
(e) an elongated bottom distribution channel extending below the full width of said sheet and having a longitudinal axis that is transverse to the longitudinal axes of the extrusion passages, said bottom distribution channel having an inlet opening at one end and an elongated outlet opening that extends at an upward angle from the inlet opening to the opposite end of the bottom distribution channel, the cross-sectional area of the bottom distribution channel gradually diminishing from the inlet opening to the opposite end thereof;
(f) an upper flow channel located above the full width of said sheet and having an inlet opening and an outlet opening that is connected to the inlet openings of the die passages;
(g) a lower flow channel located below the full width of said sheet and having an inlet opening and an outlet opening that is connected to the inlet openings of the die passages;
(h) a top feed bore connecting the inlet bore to the inlet opening of the top distribution channel;
(i) a bottom feed bore connecting the inlet bore to the inlet opening of the bottom distribution channel;
(j) a top flow compensating passage connecting the outlet opening of the top distribution channel to the inlet opening of the upper flow channel; and
(k) a bottom flow compensating passage connecting the outlet opening of the bottom distribution channel to the inlet opening of the lower flow channel.

4,295,813
APPARATUS FOR MOLDING STRAND-MOUNTED PLASTIC MEMBERS
Irving Levine, 23555 Park Belmonte, Calabassas Park, Calif.
Filed Oct. 1, 1973, Ser. No. 401,979
The portion of the term of this patent subsequent to Oct. 20, 1994, has been disclaimed.
Int. Cl.[3] B29F *1/00*
U.S. Cl. 425—121 **5 Claims**



4. An apparatus for simultaneously fabricating a plurality of thermoplastic elements on a supporting string comprising:
(a) a first plate having a first insert, said insert comprising a plurality of parallel pairs of element fabricating members, each pair of element fabricating members including a plurality of aligned element cavities, each element cavity being in communication with an adjacent element cavity by a supporting string channel, all of said support string channels being in alignment with one another, and being adapted to receive the supporting string therein whereby each of said cavities is sealed, a thermoplastic runner channel parallel to and intermediate the support string channels of the pair of element fabricating members, a plurality of thermoplastic subrunner channels depending from and communicating with said thermoplastic runner

channels, and gating means for providing communication between said thermoplastic subrunner channels and said bead cavities;

(b) a second plate having a second insert adapted to be forced adjacent said first insert, said second insert having element cavities, support string channels, thermoplastic runner channels and thermoplastic subrunner channels complementary to those disposed in said first insert, and including thermoplastic input means for receiving flowable thermoplastic material, said thermoplastic input means being disposed through said second plate and in communication with said thermoplastic runner channels;

(c) a severing pin secured to said first plate and adapted to be slidably engaged through said second plate in communication with said thermoplastic input means, the terminus of said pin adjacent said thermoplastic input means depending into a first axial member having a predetermined diameter, said first axial member depending into a second axial member having a diameter which is larger than that of said first axial member whereby the thermoplastic disposed in the thermoplastic input means is fractured in the vicinity of said first and second axial members when the first and second plates are separated;

(d) supply means for supplying a pressurized source of flowable thermoplastic, said supply means coupled to said thermoplastic input means;

(e) support string supply means for supplying a source of support string for each of said plurality of element fabricating members; and

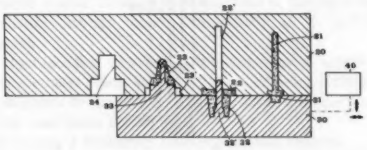
(f) means for imposing opposing forces upon said first and second plates whereby the complementary bead cavities, support string channels, thermoplastic runner channels and thermoplastic subrunner channels of said first and second inserts are adjacent one another.

4,295,814

METHOD AND APPARATUS FOR PRODUCING AND ASSEMBLING ARTICLES OF MOLDED PLASTIC PARTS

Peretz Rosenberg, Moshav Beit Shearim, Israel

Filed Jun. 27, 1979, Ser. No. 52,504
Claims priority, application Israel, Feb. 28, 1979, 56761
Int. Cl.³ B29C *24/00*
U.S. Cl. 425—517 **6 Claims**



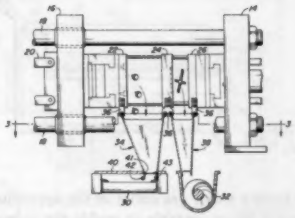
1. Apparatus for producing articles constituted of at least two plastic parts, characterized in that the apparatus includes: a pair of mold plates one overlying the other; means for effecting relative movement between said pair of mold plates towards and away from each other to close and open them; each of said pair of mold plates including at least two forming surfaces defining, in one closed position of the plates during a molding stroke of the apparatus, at least two cavities having shapes corresponding to the parts of the article, with one plate of said pair adapted to retain one of the molded parts and the other plate of said pair adapted to retain the other part when the pair of plates are open, the two forming surfaces of each plate of said pair being laterally spaced from each other; and means for effecting relative movement between said pair of plates in the lateral direction to align the two parts retained thereby in the open position of the pair of plates, such that in a subsequent closing of the pair of plates during an assembling stroke of the apparatus, the part retained by one plate of said pair is applied to the part retained by the other plate of said pair.

4,295,815

GUIDE SKIRT

Frank Eltvedt, 5 Lake Dr., Lake In The Hills, Ill. 60102

Filed Jul. 21, 1980, Ser. No. 170,847
Int. Cl.³ B29F *1/14*
U.S. Cl. 425—556 **18 Claims**



1. Apparatus for producing parts and for ejecting said parts from an ejection location, comprising

receptacle means mounted below said ejection location, and

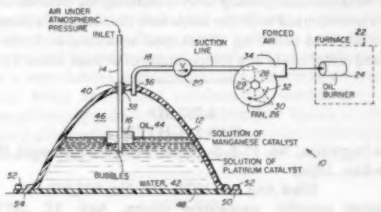
a generally tubular, limp flexible skirt mounted to said apparatus with a top opening disposed below and in proximity to said ejection location and with a bottom opening opening into said receptacle.

4,295,816

CATALYST DELIVERY SYSTEM

B. Joel Robinson, 501 Boylston St., Brookline, Mass. 02146

Continuation of Ser. No. 862,411, Dec. 20, 1977, abandoned.
This application Jun. 27, 1980, Ser. No. 163,865
Int. Cl.³ F23J *7/00*
U.S. Cl. 431—4 **6 Claims**



1. A system for the delivery of a catalyst containing not more than 9 mg of a platinum group metal per kg of fuel to a combustion system having an intake port for air comprising:

means for dispensing said catalyst in a liquid; and

means for passing a portion of said air via said liquid for absorbing said catalyst into said air.

4,295,817

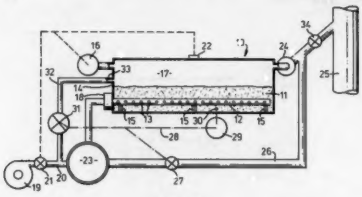
METHOD AND MEANS FOR CONTROLLING THE OPERATION OF FLUIDIZED BED COMBUSTION APPARATUS

Peter B. Caplin, Sunbury-on-Thames, and Maurice Harman, Milton Keynes, both of England, assignors to The Energy Equipment Co. Ltd., Olney, England

Filed Jul. 31, 1979, Ser. No. 62,340
Claims priority, application United Kingdom, Aug. 4, 1978, 32214/78; Dec. 11, 1978, 48028/78
Int. Cl.³ F23D *19/02*
U.S. Cl. 431—7 **21 Claims**

1. A fluidised bed combustion apparatus comprising means for supplying fuel to said fluidized bed, means for injecting combustion air into the fluidised bed of the apparatus to cause fluidisation of the bed material and to support combustion of

fuel fed to the bed, means for measuring at least one of the temperature of the bed and the thermal demand placed upon the apparatus, means for augmenting said supply of combustion air, prior to its injection into the fluidised bed with waste



gas drawn from a waste gas outlet of the apparatus, said augmenting means being operable to enable the volume of waste gas mixed with the combustion air to be varied in dependence upon at least one of the temperature of the fluidised bed and the thermal demand placed on the apparatus.

4,295,818

CATALYTIC MONOLITH AND METHOD OF ITS FORMULATION

Meredith J. Angwin, Palo Alto, Calif.; William C. Pfefferle, Middletown, N.J., and John P. Kesselring, Mountain View, Calif., assignors to United States of America, Washington, D.C.

Filed May 27, 1980, Ser. No. 153,056

Int. Cl.[3] **F23D** *3/40;* **B01J** *23/10, 23/74, 35/04*

U.S. Cl. 431—7 **9 Claims**

1. A monolithic catalytic structure formed by the steps of homogeneously interspersing throughout a carrier structure of ceramic composition a base metal oxide which upon calcination becomes catalytically active, forming the ceramic composition interspersed with the oxide into the shape of a monolithic structure, and calcining the shaped structure with the interspersed metal oxide at a temperature of at least about 1,000° C.

4,295,819

GAS LIGHTER

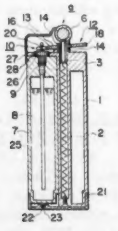
Goro Sugiyama, No. 17-5, 5-chome, Toro, Shizuoka-shi, Shizuoka-ken, Japan

Filed Aug. 11, 1978, Ser. No. 932,960

Claims priority, application Japan, Aug. 12, 1977, 52-108314[U]; Mar. 31, 1978, 53-43218[U]

Int. Cl.[3] **F23Q** *2/00*

U.S. Cl. 431—143 **2 Claims**



1. A gas lighter comprising:

(a) a body having a tooth-like support portion on an upper portion thereof and an ignition portion disposed on another upper portion thereof,

(i) said ignition portion comprising a projecting cylinder having a slantly stepped portion on either side thereof and containing a recessed portion, a flint disposed in said cylinder and partially projecting therefrom, and an ignition file,

(b) a bomb filled in its interior with a gas-evolving liquid detachably secured to said body,

(ii) said bomb being provided with a nozzle for discharging vaporized gas and a rotatably adjustable valve means communicating said interior with said nozzle, said nozzle being normally biased in a downward position whereby said valve means is closed,

(c) a member adapted to engage said nozzle for raising the same to thereby open said valve,

(iii) said member comprising a lever having a longitudinal hole on its intermediate portion and flanges on either side of said hole, said flanges being adapted to engage and recessed portions, said projecting cylinder thereby projecting through said hole, one end of said lever slidingly engaging said nozzle, and

(d) a flame-adjusting member comprising a rotatable tooth form portion fixed to said valve means and engaging said tooth-like support portion, whereby rotation of said bomb causes adjustment of said valve.

4,295,820

GAS BLENDING FLAME CUTTER

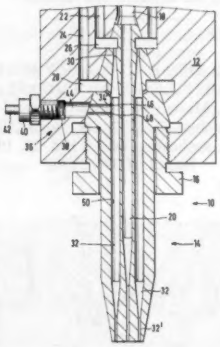
Georg Röeder, and Helmut Sachs, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1979, Ser. No. 25,287

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819132

Int. Cl.[3] **H01M** *6/18;* **F23Q** *7/06*

U.S. Cl. 431—191 **8 Claims**



1. A gas-mixture flame cutter comprising a cutting torch having a torch head, a cutting nozzle detachably engaged to said torch head, said cutting nozzle having an upstream end and a downstream end, a cutting oxygen channel extending through said torch head and through said cutting nozzle and terminating at said downstream end of said cutting nozzle, a plurality of spaced combustible mixture blend passages in said cutting nozzle and terminating at said downstream end of said cutting nozzle adjacent said cutting oxygen channel whereby said cutting oxygen channel and said blend passages are exposed at said downstream end of said cutting nozzle, heating oxygen passage means in said torch head communicating with said blend passages for supplying heating oxygen to said blend passages, fuel gas passage means in said torch head communicating with said blend passages for supplying fuel gas to said blend passages, one of said blend passages being an ignition blend passage, an ignition device being in flow communication with said ignition blend passage at said upstream end of said cutting nozzle, and the remaining blend passages being out of flow communication with said ignition device whereby actuation of said ignition device causes the combustible mixture in

said ignition blend passage to ignite and to be extinguished after igniting the combustible mixture exiting from said remaining blend passages with the ignited combustible mixture from said remaining blend passages then re-igniting the combustible mixture from said ignition blend passage.

4,295,821

APPARATUS FOR BURNING LIQUID FUEL

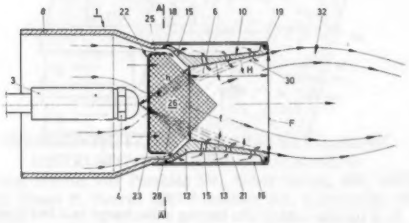
Siegfried Schilling, Volketswil, Switzerland, assignor to Oertli AG Dubendorf, Zurich, Switzerland

Filed Aug. 21, 1979, Ser. No. 68,404

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1978, 2836534

Int. Cl.³ F23D *15/02*

U.S. Cl. 431—353 **5 Claims**



1. A liquid fuel burner particularly suited for low rates of fuel combustion, comprising an atomizer nozzle having a mouth at its front from which liquid fuel issues as a spray that is mainly in the form of a forwardly divergent cone of droplets substantially coaxial with said nozzle, and a combustion air duct through which combustion air flows forward to be mixed and combusted with the sprayed fuel, said fuel burner being characterized by:

A. an annular flame holder coaxial with the nozzle and spaced a small distance forward from it, having a central aperture through which substantially all of said spray passes;

B. a duct-like fuel vaporizer defining a zone in which combustion takes place, said fuel vaporizer being substantially concentric to the nozzle, spaced a small distance forward from said flame holder and

(1) having a forwardly convergent inlet section,

(2) having a diffuser section which extends forwardly from said inlet section and which has an inner surface that diverges forwardly and is so spaced from the mouth of the nozzle that between about 20% and about 40% of said spray can impact the same,

(3) being of a material that conducts heat readily so as to be quickly heated by combustion in said zone to a temperature at which spray droplets impacting said surface are vaporized, and

(4) being supported by said combustion air duct in thermally insulated relation thereto; and

C. said combustion air duct having a portion connected with the inlet section of the fuel vaporizer and coaxially surrounding the flame holder in radially spaced relation thereto to cooperate with the periphery of the flame holder in defining an annular passage, said portion of the combustion air duct thus constraining all combustion air from said combustion air duct to enter the inlet section of the fuel vaporizer, part of such air through said central aperture in the flame holder and the remainder through said annular passage.

4,295,822

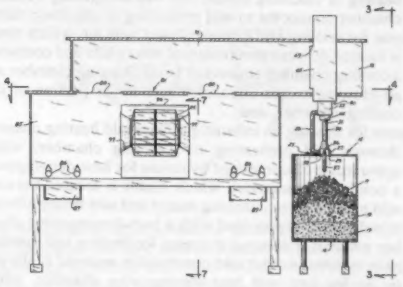
PRODUCER GAS FUELED BURNER SYSTEM AND DRYING APPARATUS

Crom B. Campbell, 222 Glenview Dr., Des Moines, Iowa 50312

Filed Oct. 1, 1979, Ser. No. 80,207

Int. Cl.³ F24H *1/00*

U.S. Cl. 432—29 **38 Claims**



1. In combination with a gas producer, said gas producer being suitable for generating a combustible producer gas from the combustion of organic materials, said combustible producer gas comprising a producer gas flow traveling through a portion of said organic materials, said producer gas flow including distillates which distill out of said organic materials and comprising a producer gas/distillate flow, said distillates have a condensation temperature, comprising:

a burner means for combustion of said combustible producer gases externally disposed with respect to said gas producer; and

a burner throat means for providing fluid communication with and disposed between said producer and said burner means, said burner throat means carrying said producer gas/distillate flow from said producer to said burner means, said burner throat means including a superheating means for superheating said producer gas/distillate flow to a superheated temperature, said superheated temperature being above said condensation temperature, said superheated producer gas/distillate flow having a temperature above said condensation temperature while flowing through said burner throat means.

4,295,823

APPARATUS FOR CONTINUOUSLY PRODUCING A CEMENT CLINKER

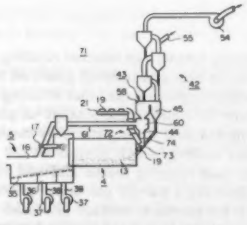
Tadashi Ogawa, Ichikawa; Shunichiro Ono, Musashino, and Kyoichi Shibuya, Narashino, all of Japan, assignors to Sumitomo Cement Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1980, Ser. No. 134,461

Claims priority, application Japan, Apr. 3, 1979, 54-39337

Int. Cl.³ F27B *7/02*

U.S. Cl. 432—106 **9 Claims**



1. An improved apparatus for continuously producing a cement clinker, comprising:

means for feeding a cement material;

means for preheating or calcining said cement material, which means is located downstream from said feeding means and is provided with a preheating or calcining chamber therein;

a rotary kiln for converting said cement material to a cement clinker, which kiln is located downstream from said preheating or calcining means, said kiln comprising a heating chamber connected to said preheating or calcining means;

means for cooling said cement clinker with air, which means is located downstream from said rotary kiln and comprises a cooling chamber connected to said heating chamber and air-blowing means connected to a lower portion of said cooling chamber, and;

means for flowing an exhaust gas from said heating chamber through said preheating or calcining chamber, which apparatus is characterized by means for heat-decomposing a combustible material, which means is located between said preheating or calcining means and said rotary kiln and which means is provided with a heat-decomposing chamber which is connected to means for feeding said combustible material so that said combustible material is allowed to be fed into said heat-decomposing chamber, which heat-decomposing chamber is connected to said heating chamber in said rotary kiln in such a manner that at least a portion of the exhaust gas from said heating chamber is allowed to flow into said heat-decomposing chamber and a solid residue produced from said combustible material in said heat-decomposing chamber is allowed to be introduced into said heating chamber, and which heat-decomposing chamber is connected to said pre-heating or calcining chamber so that a combustible gas generated from said combustible material in said heat-decomposing chamber is allowed to flow into said preheating or calcining chamber.

4,295,824

SYSTEM FOR SEALING OF KILNS

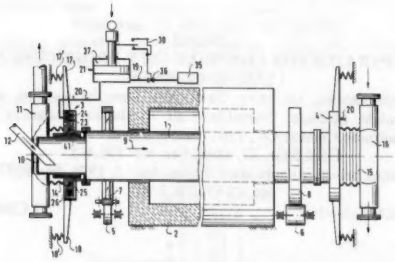
Johannes C. Wens, Nijmegen, Netherlands, assignor to Smit Ovens Nijmegen B.V., Nijmegen, Netherlands

Filed Oct. 17, 1979, Ser. No. 85,526

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1978, 2846387

Int. Cl.[3] **F27B** *7/24;* **F27D** *1/18;* **F26B** *25/00*

U.S. Cl. 432—115 **9 Claims**



1. In a rotating furnace, an internal rotating means carrying parts subjected to heat and internal gases, an outer supporting stationary means supporting the inner rotating means, a sealing assembly means for limiting the leakage of gas and heat from said rotating means, said sealing assembly means comprising: at least one outer sealing sleeve positioned for sealing engagement between said rotating means and said stationary means, means for delivering a barrier gas under pressure to urge said sealing sleeve by pressure contact into said sealing engagement, and an intermediate bearing ring between said internal rotating means and said outer supporting means for absorbing the compression pressure forces therebetween and for acting as a spacer ring between said rotating and stationary means, said intermediate ring sealing a portion of said internal gas from flowing to said outer sealing sleeve.

4,295,825

SYSTEM FOR THE PROTECTION OF THE DELIVERY END OF A ROTARY KILN

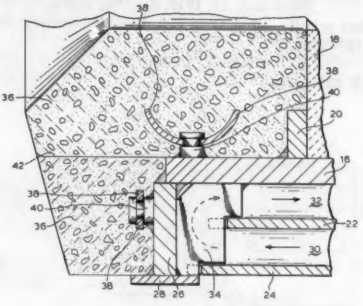
Alain Chielens, Marcq en Baroeul, and Bernard Boussekey, Lille, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Dec. 4, 1979, Ser. No. 100,239

Claims priority, application France, Dec. 7, 1978, 78 34456

Int. Cl.[3] **F27B** *7/38*

U.S. Cl. 432—116 **8 Claims**



1. A tubular rotary kiln having a discharge end and comprising

(a) metal shell having an internal and an external surface, the metal shell terminating in an end adjacent the discharge end,

(b) a refractory lining covering the internal shell surface up to a distance from the shell end and leaving a remaining portion of the internal shell surface uncovered,

(c) a flange fastened to the shell end at the discharge end of the kiln and extending radially outwardly from the shell, the flange having a front face and a rear face,

(d) a discharge end protective device including a refractory concrete ring covering the uncovered portion of the internal shell surface and the front face of the flange, the refractory concrete ring being anchored to the shell and to the flange, and

(e) means for circulating cooling air along the rear face of the flange and the external shell surface.

4,295,826

INFRARED DRYER

Michael Vasilantone, 34 Columbia Rd., Somerville, N.J. 08876

Filed Jun. 20, 1980, Ser. No. 161,488

Int. Cl.[3] **F27B** *17/00;* **F26B** *19/00*

U.S. Cl. 432—185 **28 Claims**

1. A heating device comprising:

(a) a heating chamber in which objects are to be exposed to heat;

(b) at least one heater in said heating chamber;

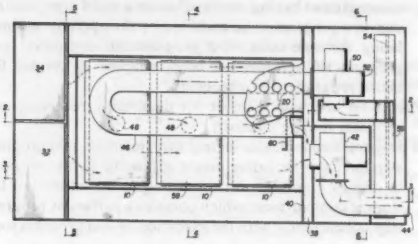
(c) a first air trough disposed above said heating chamber;

(d) first means of fluid communication for communicating effluent air from said heating chamber to said first air trough;

(e) a second air trough disposed above said first air trough, extending along the upper surface or cover of the heating device, and serving to continually cool the upper surface or cover of the heating device;

(f) a header disposed above said heating chamber, said

header being ported to permit air from said header to be directed onto the objects to be exposed to heat; and



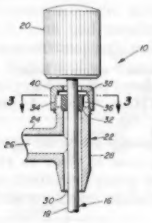
(g) second means for recirculating air from said heating chamber into said header.

4,295,827

ENDODONTIC FLOW THROUGH ULTRASONIC INSTRUMENT HOLDER ATTACHMENT

Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20907, and James P. Norris, 1207 Frederick Rd., Catonsville, Md. 21228

Filed Dec. 31, 1979, Ser. No. 108,969
Int. Cl.³ A61C *5/02*
U.S. Cl. 433—81 **12 Claims**



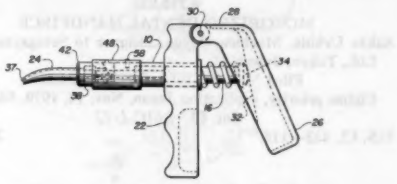
1. In combination, an endodontic instrument, an ultrasonic transducer device, a holder attachment for said instrument and ultrasonic transducer device, and an instrument locking means, said holder attachment consisting of a first hollow tube-like member and a second hollow tube-like member, said first and second hollow tube-like members being permissively and selectively capable of being set at any one of a plurality of angular relationships to each other, said ultrasonic transducer being coupled to one end of said first hollow tube-like member and with the opposite end of said first hollow tube-like member being coupled and affixed to said second hollow tube-like member at one selected position of said plurality of angular relationships, the interior of said first hollow tube-like member communicating with the interior of said second hollow-tube-like member, said instrument locking means being coupled to one end of said second hollow tube-like member, said endodontic instrument being mounted in said instrument locking means, the opposite end of said second hollow tube-like member being open for passing said endodontic instrument therethrough, said opposite end of said second hollow tube-like member also being open for passing a solution therethrough as and when received from said first hollow tube-like member.

4,295,828

EJECTOR HOLDER FOR SYRINGE-TYPE CARTRIDGE

Helmut Rudler, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Sep. 25, 1980, Ser. No. 190,681
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—90 **6 Claims**



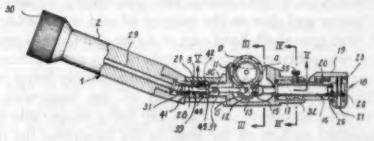
1. A manually-operable ejector holder for a loaded syringe-type cartridge provided with an annular collar on one end and a discharge tip on the other, said holder comprising in combination, an elongated barrel, a plunger reciprocable therein and one end thereof projecting beyond one end of said barrel, manually engageable means on said one end of said barrel operable to reciprocate said plunger toward and from the other end of said barrel, said other end of said barrel having a curved transverse recess positioned and operable to receive a portion of said collar on said cartridge, a locking member having one end pivotally connected to said barrel and also having a curved transverse recess complementary to said opposite recess in said other end of said barrel and operable to receive an opposite portion of said collar on said cartridge, and a securing member slidable over said locking member and along the other end of said barrel to releasably connect said cartridge to said holder and the other end of said plunger being slidable toward said cartridge in axial alignment with said collar of said cartridge to penetrate said cartridge and effect discharge to the contents thereof.

4,295,829

TOOL HOLDER

Claude Martinelli, and Marcelle Martinelli epouse Boisson, both of 5, Place du Marche, Gracay, France (18310)

Filed Jul. 17, 1979, Ser. No. 58,379
Claims priority, application France, Aug. 8, 1978, 78 23369
Int. Cl.³ A61C *1/02*; B25G *3/00*
U.S. Cl. 433—99 **18 Claims**



1. A tool holder for holding a tool, said tool holder having a bent handle and having first and second ends; said holder comprising:

(a) a head comprising means for receiving said tool, said head being arranged at said first end of said tool holder;

(b) an operating knob arranged intermediate said first and second ends, said operating knob being operatively associated with said head whereby rotation of said operating knob results in movement of said tool;

(c) securing means for securing said head to said holder in a fixed angular position relative thereto, and whereby the angular position of said head is adjustable relative to said handle;

(d) an auxiliary operating knob arranged at the second end of said holder on said handle, said auxiliary operating knob

being operatively associated with said head whereby rotation of said auxiliary operating knob results in movement of said tool; and

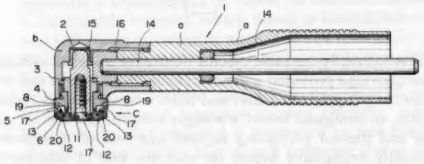
(e) a multiplier system for providing the desired magnitude of movement to said tool in response to movement of said operating knob.

4,295,830

MOTORIZED DENTAL HANDPIECE

Sakae Uchida, Machida, Japan, assignor to Setagayaseiki Co. Ltd., Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 134,254
Claims priority, application Japan, Nov. 14, 1979, 54/147493
Int. Cl.[3] A61C *1/12*
U.S. Cl. 433—115 **3 Claims**



1. A motorized dental handpiece having a head and a head cap portion connectable therewith, said head cap portion comprising:

a head gear shaft including a threaded section;

a head gear rotatable with said head gear shaft;

a head cap having a threaded section;

a flange rotatable with said head gear shaft, said flange including a threaded section cooperable with said threaded section of said head gear shaft;

a seal ring positionable between said head cap and said flange, said head cap being provided with a circumferentially extending groove in the axially outer peripheral surface thereof for reception of the axially inner portion of said seal ring, said flange being provided on the axially inner surface thereof with a circumferentially extending guide groove for reception of the axially outer portion of said seal ring, said seal ring having a V-shaped groove formed in the outer peripheral surface thereof and thereby forming radially inner and outer circumferentially extending edges, said edges being engageable with opposing surfaces of said flange, a wall of said seal ring proximate said radially inner edge thereof being at least coextensive and engageable with the radially inner wall of said guide groove, said regions of engagement thereby providing a plurality of circumferential seals preventing the admission of water and dust to the interior of said cap portion;

said head gear shaft, head cap, seal ring and flange constituting releasably connected members of a unitary head cap portion assembly, said cap portion assembly being releasably connectable to the head of the handpiece, said threaded section of said head cap being cooperable with a threaded section on the head of the handpiece for releasably connecting said unitary assembly thereto.

4,295,831

COMPUTER PROGRAMMING TRAINING DEVICE

Frederick C. Matt, 1566 Campus Dr., Maple Glen, Pa. 19002

Filed Apr. 16, 1979, Ser. No. 30,321
Int. Cl.[3] G09B *19/00*
U.S. Cl. 434—118 **10 Claims**

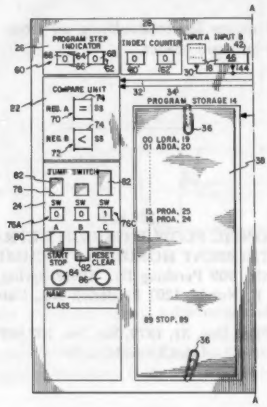
1. A computer programming training device for teaching an operator the fundamentals of computer programming and operation, said device being operated by the operator to duplicate the physical functions performed by a programmable computer, said device comprising:

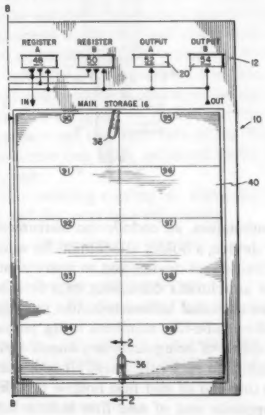
a base member serving as a console for said device;

a substantially planar program storage member mounted on said base member to be detachable as a unit, said program storage member having a plurality of storage compartments each bearing a unique address identification, each compartment having written therein a word comprising a step in a program to be executed by the operator in simulating the operation of a programmed computer, said program storage member being adapted to contain the entire program to be executed;

means on said base member for detachably receiving said program storage member;

a program step indicator on said main member, said program step indicator including means adjustable by the operator to display a number corresponding to the address of the storage compartment which contains a particular program step concurrently with the execution of said program step;





a substantially planar main storage member mounted on said base member, said main storage member having a plurality of storage compartments each bearing a unique address which is different from any address borne by a compartment of said program storage member, the operator providing intercommunication between said program storage member and said main storage member so that, upon instruction by one of the program steps in a compartment of said program storage member, data from a compartment of one thereof may be transferred and written into a compartment of the other;

means on said base member for receiving said main storage member;

input means on said base member for receiving data from the operator, said data being written by the operator directly into one of the compartments of said main storage member upon instruction by one of the program steps stored in a compartment of said program storage member;

output means for receiving data directly from a compartment of said main storage member, said output means including means for receiving data, said data being copied by the operator from said main storage means upon instruction from a program step stored on said program storage member; and

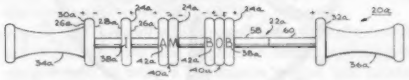
operational register means on said base member for storing data, the operator providing intercommunications between said register means and said main storage member so that, upon instructions by a program step stored on said program stored means, data from said register means is written into a prescribed compartment of said main storage member and data from prescribed compartment of said main storage member may be provided to said register means.

4,295,832

EDUCATIONAL TOY

Manuel L. Karell, 17925 Devonshire, Apt. 21, Northridge, Calif. 91325

Filed Nov. 5, 1979, Ser. No. 91,586
Int. Cl.³ G09B *1/06*
U.S. Cl. 434—168 **5 Claims**



1. A novel educational toy comprising in combination:

a. an elongated support rod;

b. a plurality of separate magnetic members slideably received on said rod, each said member having a pair of opposite sides of opposite magnetic polarity, said members being mutually magnetically attracted into separate groups on said rod, said groups being mutually magnetically repelled from each other so as to be spaced along said rod;

c. wherein some of said members bear identifying indicia;

d. wherein members of each of said groups collectively provide a separate distinctive group indicium; and

e. wherein said indicia are letters of the alphabet.

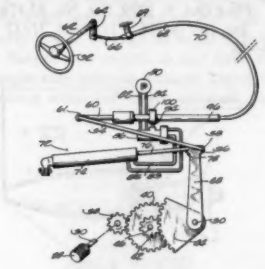
4,295,833

INBOARD-OUTBOARD DRIVING MECHANISM INCLUDING A HYDRAULICALLY ASSISTED STEERING SYSTEM

Gaylord M. Borst, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 23, 1978, Ser. No. 953,566
Int. Cl.³ B63H *1/14, 5/06, 25/42*
U.S. Cl. 440—63 **9 Claims**

1. An inboard-outboard driving mechanism for a boat, said mechanism including a support adapted to be fixed relative to a boat hull, a propulsion leg including a rotatably mounted propeller, means connecting said propulsion leg to said support for pivotal steering movement about a steering axis, and means for causing pivotal steering movement of said propulsion leg including a steering shaft having a second axis transverse to said steering axis and rotatably journaled in said support, means connecting said steering shaft and said propulsion leg for pivoting said propulsion leg in response to rotation of said steering shaft, a lever mounted for pivotal movement about an axis transverse to said steering axis and having a first end and a second end, gear means connecting said first end of said lever and said steering shaft and operable, in response to rotation of said lever, to rotate said steering shaft at an angular rate greater than the rate of rotation of said lever, a fluid motor connected



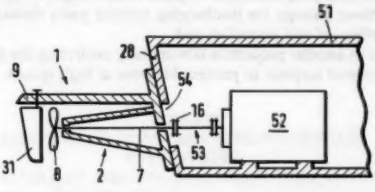
to said second end of said lever, and means for actuating said fluid motor to cause pivotal movement of said lever.

4,295,834

DRIVE MECHANISM FOR A WATERCRAFT WITH A SURFACE PROPELLER

Fabio Buzzi, Annone Brianza Como, and Sergio Carniti, Oggiono Como, both of Italy, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jul. 17, 1979, Ser. No. 58,168
Claims priority, application Italy, Jul. 18, 1978, 25840 A/78
Int. Cl.³ B63H *5/16*
U.S. Cl. 440—76 **14 Claims**



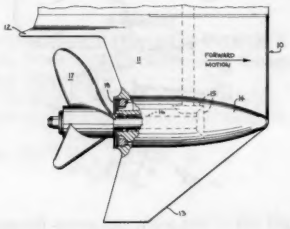
1. In a drive mechanism for a watercraft having a surface propeller rotatingly driven by a drive motor arranged inboard thereof through shaft means which extends through a transom plate on the hull of said watercraft, the improvement comprising wherein a hollow support arm is provided and has a flange plate on one end thereof directly rigidly fastened to said transom plate of said watercraft, wherein said shaft means includes a substantially straight propeller shaft positioned on the outboard side of said transom plate and extending through the interior of said hollow support arm and having a propeller on one end thereof adjacent the free end of said support arm remote from said one end, wherein in the region of said flange plate there is arranged a propeller thrust bearing for facilitating a transmitting of the propeller thrust on said straight shaft to said flange plate and thence to said transom plate of said watercraft, and wherein said hollow support arm is of a unitary construction, and comprises a box-shaped lower part which extends in longitudinal direction with coaxial openings therein to facilitate the support of said propeller shaft therein and of a box-shaped upper part which also extends in longitudinal direction and is provided thereabove, which upper part is designed as a cavitation plate and projects at its rear end beyond the lower part, and wherein rib means are provided for connecting said upper and lower parts together, said rib means extending in longitudinal direction and on the front end thereof merging into said flange plate.

4,295,835

HIGH SPEED OUTBOARD DRIVE UNIT

Charles W. Mapes, and Richard H. Snyder, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 9, 1979, Ser. No. 83,176
Int. Cl.³ B63H *1/14, 5/06, 21/32*
U.S. Cl. 440—78 **8 Claims**



1. An engine driven outboard drive unit for attachment to a watercraft comprising:

(A) a generally vertical housing;

(B) a generally vertical drive shaft journalled for rotation within said housing and driven by said engine;

(C) a generally horizontal propeller shaft driven by the lower end of said drive shaft;

(D) a propeller mounted on the aft end of said propeller shaft;

(E) a streamlined torpedo of generally cylindrical shape fixed to the lower end of said housing with said propeller shaft journalled for rotation within said torpedo forward of said propeller, said torpedo comprising an engine exhaust passage for discharging exhaust gases through the plane of said propeller; and

(F) an annular projection substantially encircling the aft end of said torpedo to prevent blowout at high speeds.

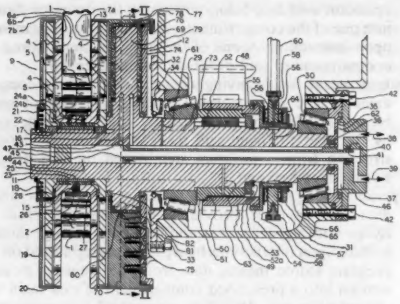
4,295,836

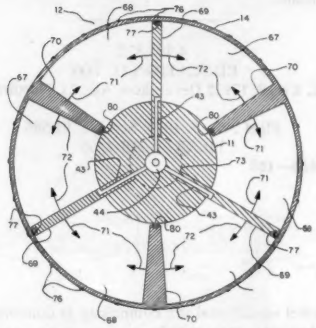
FLAT BELT TRANSMISSION WITH ROTARY ACTUATOR AND INTEGRATED CONTROL SYSTEM

Emerson L. Kumm, 1035 E. Laguna Dr., Tempe, Ariz. 85282

Filed Jun. 1, 1979, Ser. No. 44,747
Int. Cl.³ F16H *11/02, 55/54*
U.S. Cl. 474—51 **6 Claims**

1. A variable diameter pulley comprising two spaced, axially fixed sheaves, each having an inner and outer rotatable disc, said inner discs being rigidly interconnected and said outer discs being rigidly interconnected, means in said inner and outer discs defining oppositely angled, intersecting guideways, and drive elements having means for movably engaging said guideways at their intersections, said inner and outer rotatable discs including at least one pair of first and second chambers and means for exerting variable fluid pressure within said chambers, whereby, responsive to changes in the differential fluid pressure of said first and second chambers, said inner and outer discs rotate relative to each other for producing a radial shift of position of the intersections of said guideways and their





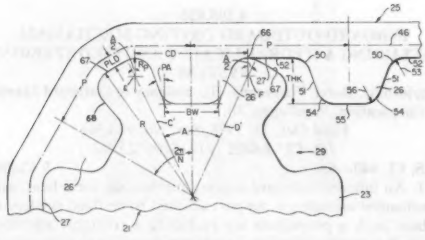
associated drive elements, thereby changing the effective diameter of said pulley.

4,295,837

SYNCHRONOUS BELT DRIVE SYSTEM

Richard L. Marsh, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Mar. 17, 1980, Ser. No. 130,661
Int. Cl.³ F16H *7/02;* **B21D** *53/28*
U.S. Cl. 474—153 **20 Claims**



1. In a toothed pulley for use in a synchronous drive power transmission system with a toothed endless power transmission belt made primarily of a polymeric material, the improvement wherein said toothed pulley has an optimum radius for its pulley teeth addendum circle having a size between the limits of a maximum radius determined by the radius of a circle through the points of a regular polygon having N equal sides and a minimum radius determined by the radius of a circle

having N arcs each equal in arcuate length to the length of each side of said polygon.

4,295,838

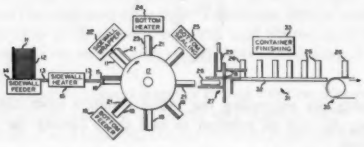
METHOD OF PRODUCING CYLINDRICAL CONTAINERS

Frank P. Richards, Prairie Village, Kans., and Raymond C. Taylor, Grandview, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 853,651, Nov. 21, 1977, Pat. No. 4,204,462, which is a division of Ser. No. 630,555, Nov. 10, 1975, Pat. No. 4,072,226. This application Dec. 31, 1979, Ser. No. 108,437

Int. Cl.³ B31C *1/06*

U.S. Cl. 493—105 **6 Claims**



1. A method for forming a tubular container, said method comprising:

forming a closure blank into a closure member having a desired shape;

maintaining said closure member adjacent the end of a tubular mandrel;

heating opposing side margins of a sidewall blank having a thermoplastic coating on both sides thereof;

wrapping said sidewall blank around said mandrel to overlap and thermally bond said previously heated opposing side margins and to bring a continuous end of said sidewall blank into contact with a portion of said closure member;

heating said end of said sidewall blank and the adjacent portion of said closure member;

rolling said end of said sidewall blank and the adjacent portion of said closure member together to seal said closure member to said sidewall blank to form a container;

removing said container from said mandrel;

successively advancing individual containers of a series of open-topped containers so removed to a container finishing station;

gripping a bottom portion of the container located at said finishing station;

finishing the thus gripped container by altering the configuration of the open container top while said bottom portion is so gripped;

releasing said bottom portion upon completion of the finishing of said container; and

removing the thus released container from said finishing station.

4,295,839

METHOD AND APPARATUS FOR FORMING A FLANGED TRAY

Thomas R. Baker, and Peter C. Collura, both of Los Altos, Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Jul. 6, 1979, Ser. No. 55,050

Int. Cl.³ B31B *1/48*

U.S. Cl. 493—143 **16 Claims**

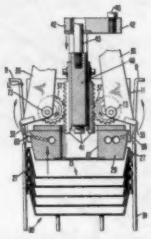
1. A method of forming a tray from a paperboard blank or the like having inherent resiliency, the tray including a base panel, two pairs of wall panels attached to the base panel, panels formed at the corners of the wall panels, and flanges formed along the outer edge of each wall panel, comprising the steps of:

providing adhesive on at least one of each adjacent wall panel and corner panel;

forming said tray wall panels into an erected position;

folding each said corner panel to contact an adjacent wall panel such that the adhesive is in the area of contact;

folding said flanges outwardly and downwardly from said erected tray wall panels into an overbroken position to lie in an acute angle with respect to said wall panels, said flanges being folded through an angle sufficient to overbreak the flanges with respect to said walls such that said folded flanges may relax to a raised, approximately horizontal position when said tray is released;



retaining said flanges against the resiliency of the blank in said overbroken position over and in contact with said corner panels to retain said panels in contact with the adjacent wall panels for a time sufficient to allow an adhesive bond to form therebetween; and

releasing said tray to allow upward movement of the flanges to the raised position, whereby a tray is formed with a substantially continuous horizontal flange around the periphery thereof to allow sealing of a cover to the tray.

4,295,840

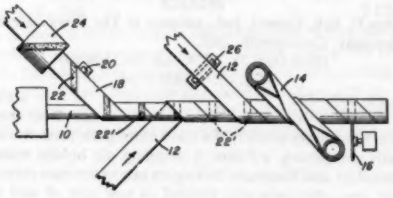
METHOD OF CONSTRUCTING COMPOSITE CONTAINERS

Jerry F. Sansbury, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Division of Ser. No. 865,799, Dec. 30, 1977, Pat. No. 4,158,425. This application Nov. 2, 1978, Ser. No. 957,107

Int. Cl.³ B31C *3/04*

U.S. Cl. 493—278 **10 Claims**

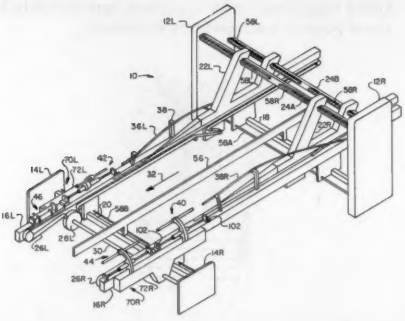


5. A method of forming a lined tubular body of composite construction comprising forming a liner of a tubular configuration with spaced adhesive bands about the exterior thereof, forming a composite tube about said liner, adhesively securing the composite tube to the liner solely by the spaced adhesive bands while retaining the liner, between the spaced adhesive bands, free of attachment to the composite tube and capable of movement relative thereto, and transversely severing the composite tube and liner through each adhesive band to define individual tubular bodies with liners secured solely at the opposed ends thereof.

4,295,841
BOX BLANK FOLDING APPARATUS

Henry D. Ward, Jr., Cockeysville, Md., assignor to The Ward Machinery Company, Cockeysville, Md.

Filed Oct. 19, 1979, Ser. No. 86,600
Int. Cl.³ B31B *1/42, 1/54*
U.S. Cl. 493—295 **10 Claims**



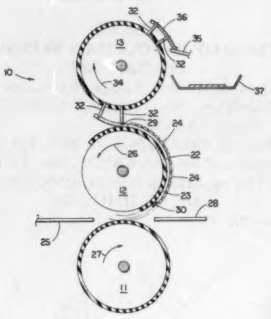
1. Box blank folding apparatus comprising in combination:
advancing means for serially advancing box blanks continuously through said apparatus;
first folding means near an upstream end of said advancing means for folding outer panels of said box blanks to a substantially upright position as said blanks advance through said apparatus,
said first folding means comprising pivotable bar folder means near an upstream end of said advancing means and reciprocable in the direction of travel of said blanks for engaging substantial portions of said outer panels during the advance of said blanks through said apparatus; and
second folding means downstream from said first folding means for folding said outer panels from said upright position to a substantially horizontal position against inner panels of said blanks,
said second folding means comprising pivotable bar folder means reciprocable in the direction of travel of said blanks for engaging substantial portions of said outer panels during the advance of said box blanks through said apparatus.

4,295,842
STRIPPING DEVICE FOR REMOVING WASTE SHEET BOARD

Clinton C. Bell, Carmel, Ind., assignor to The Ward Machinery Company, Cockeysville, Md.

Filed Dec. 31, 1979, Ser. No. 108,803
Int. Cl.³ B26D *7/18*
U.S. Cl. 493—342 **8 Claims**

1. In a stripping device for removing waste sheet wedged within the cutting portion of a sheet cutting die rotatable about an axis comprising: a frame; a stripping pin holder rotatably mounted on said frame and having an axis of rotation extending in the same direction and parallel to said axis of said sheet cutting die; a plurality of stripping pins mounted to said stripping pin holder and extending outwardly therefrom, said stripping pins have length and are positionable adjacent said sheet cutting die as said stripping pin holder rotates to extend into said sheet cutting die piercing said waste sheet and removing said waste sheet from said sheet cutting die upon continued rotation of said sheet cutting die and said stripping pin holder; and means operably engaged with said stripping pin holder to rotate said stripping pin holder in synchronization with said sheet cutting die; the improvement comprising: means causing the stripping pins to exert lifting action pressure against said waste sheet, including the radial distance from said stripping pin axis of rotation to the outermost extremity of each said

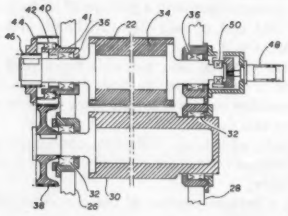


stripping pin exceeding the radial distance from said sheet cutting die axis of rotation to said sheet cutting die cutting portions.

4,295,843
ROTARY DIE CUTTER

Tadao Otomaru, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 108,232
Claims priority, application Japan, Jan. 8, 1979, 54-815
Int. Cl.³ B31B *9/14*
U.S. Cl. 493—354 **6 Claims**



1. A rotary die cutter comprising:
(a) a knife cylinder having a punching blade on its peripheral surface;
(b) an anvil cylinder positioned adjacent said knife cylinder and arranged to be engaged by said blade for punching a cardboard sheet passing between said cylinders;
(c) first and second meshing gears for driving said cylinders, said first gear being arranged at one end of said knife cylinder and said second gear being arranged at one end of said anvil cylinder;
(d) first and second interengaging helical gears disposed at said one end of said anvil cylinder, said first helical gear being mounted on said anvil cylinder, said second helical gear being connected to said second meshing gear;
(e) mechanism engaging said anvil cylinder for moving said anvil cylinder axially;
(f) said axial movement of said anvil cylinder causing relative axial movement of said helical gears to impart a rotational shift to said anvil cylinder; and
(g) adjusting means engaging one of said helical gears to move said one of said helical gears axially for imparting a further rotational shift to said anvil cylinder.

4,295,844

PROCESS FOR THE THERMAL STABILIZATION OF ACRYLIC FIBERS

Steven B. Warner, Bernardsville, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,706
Int. Cl.[3] D06Q *1/02*
U.S. Cl. 8—115.5 12 Claims

1. An improved process for the thermal stabilization of an acrylic fibrous material selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers containing at least about 85 mol percent of acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith comprising:

(a) contacting said fibrous material with a dilute solution of aniline and Group IA metal hydroxide which is provided at an elevated temperature for a residence time of approximately 5 to 30 minutes whereby said fibrous material is rendered capable of undergoing thermal stabilization on a more expeditious basis,

(b) removing the excess quantity of said solution adhering to said fibrous material following said contact, and

(c) heating said resulting fibrous material in an oxygen-containing atmosphere at a temperature of approximately 200° to 360° C. until a stabilized fibrous material formed which is black in appearance, retains its original configuration substantially intact and which is non-burning when subjected to an ordinary match flame.

4,295,845

PRETREATMENT COMPOSITION FOR STAIN REMOVAL

Ralph R. Sepulveda, Suffern, N.Y., and Lynn H. Lander, Harrington Pk., N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 49,774, Jun. 18, 1979. This application May 19, 1980, Ser. No. 151,227
Int. Cl.[3] C11D *3/46, 7/26;* D06L *1/02, 1/22*
U.S. Cl. 8—139.1 4 Claims

1. A method for the pre-laundering treatment of stained fabrics comprising contacting said fabric with an active composition containing little or no water and having little tendency to exhibit separation, said composition comprising at least one ester formed of a fatty acid of about eight to about twenty-two carbon atoms chain length, and

(1) an alcohol of one to about four carbon atoms chain length or

(2) a polyalkylene glycol which is a polyethylene or polypropylene glycol; and wherein said ester is a di-ester.

4. A method for the pre-laundering treatment of stained fabrics comprising contacting said stained fabric with an active composition containing little or no water and having little tendency to exhibit separation with an active composition, said composition comprising:

(a) about 25% to about 90% of at least one ester formed of a fatty acid of about eight to about twenty-two carbon atoms chain length, and

(1) an alcohol of one to about four carbon atoms chain length or

(2) a polyalkylene glycol which is a polyethylene or polypropylene glycol; and wherein said ester is a di-ester;

(b) 0 to about 75% of at least one nonionic surface-active agent; and

(c) 0 to about 60% of at least one anionic surface-active agent.

4,295,846

PROCESS FOR THE PRODUCTION OF FORMALDEHYDE-FREE FINISHING AGENTS FOR CELLULOSIC TEXTILES AND THE USE OF SUCH AGENTS

Harro Petersen, Frankenthal, Fed. Rep. of Germany; Panemangalore S. Pai, Charlotte, N.C.; Friedrich Klippel, Ludwigshafen, and Friedrich Reinert, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 18, 1980, Ser. No. 131,409
Int. Cl.[3] D06M *13/34*
U.S. Cl. 8—186 2 Claims

1. A process for the production of formaldehyde-free, easy-care finishing agents with a long shelf life for textiles containing or consisting of cellulose on the basis of urea or N,N'-disubstituted ureas and glyoxal, comprising in the first stage of the process, reacting 1 to 1.1 mole of urea or symmetrically disubstituted urea of the general formula I

$$R^1—HNCONH—R^2 \qquad I$$

where

R^1 and R^2 are $-[(CH_2)_nO]_mR^3$ or hydrogen,

R^3 is C_{1-4} alkyl or, if m>O, hydrogen, n is 2 to 4

m is 0 to 10,

for three hours in aqueous solution with 1 mole of glyoxal, in the presence of buffer mixtures sufficient to maintain the pH of the solution between 4 and 6.8, at a temperature of from 20° to 60° C., and, in the second stage, reacting the solution resulting from the first stage, after admixing, with at least 0.5 mole of an alcohol R^4OH, where R^4 is $[(CH_2)_nO]_mR^3$, where R^3, except for hydrogen; m and n are defined above, and an acid, for one to three hours at a pH of between 2 and 4.5 and a temperature of from 30° to 65° C., and finally adjusting the pH of the solution to 4 to 7.

4,295,847

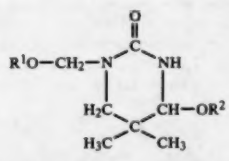
FINISHING PROCESS FOR TEXTILES

Harro Petersen, Frankenthal, Fed. Rep. of Germany; Panemangalore S. Pai, and Manfred Reichert, both of Charlotte, N.C., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,264
Int. Cl.[3] D06M *13/38, 15/38, 15/54, 1/02*
U.S. Cl. 8—189 2 Claims

1. A process for finishing a cellulosic textile which has been pretreated with liquid ammonia, by impregnating the textile with a finishing agent based on an aminoplast intermediate and heating for from 10 seconds to 6 minutes at from 110° to 230° C. in the presence of an acid or latent acid catalyst, wherein the finishing agent employed is a water-soluble compound of the formula III

III



where R^1 and R^2 independently of one another are hydrogen, methyl, ethyl, propyl or methoxyethyl and R^2 may also be the radical of an ethylene oxide and/or propylene oxide polymer chain comprising from 1 to 20 monomer units.

4,295,848

COMPOSITION FOR HAIR DYEING WHICH CONTAINS A PARA BASE AND AN ORTHO BASE

Jean F. Grollier, Paris; Andree Bugaut, Boulogne-Billancourt; Patrick Andrillon, Aulnay-sous-Bois, and Chantal Fourcadier, Paris, all of France, assignors to L'Oreal, Paris, France

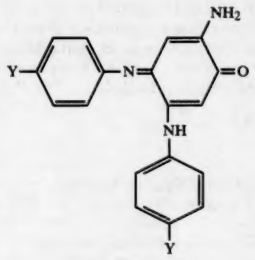
Division of Ser. No. 27,363, Apr. 5, 1979. This application Oct. 29, 1980, Ser. No. 201,505

Claims priority, application France, Apr. 6, 1980, 78 10278

Int. Cl.[3] C07C *50/80, 119/12*

U.S. Cl. 8—421 4 Claims

1. A compound of the formula:



(IV)

in which: Y represents

R'_1 and R'_2 independently of one another denoting an alkyl, mesylaminoalkyl, piperidinoalkyl or hydroxyalkyl group, the alkyl groups containing 1 to 6 carbon atoms, or a cosmetically acceptable salt thereof.

4,295,849

PROCESS FOR THE PREPARATION OF DYESTUFF FORMULATIONS

Konrad Nonn; Karlheinz Wolf; Artur Haus, and Reinhold Hörnle, all of Bayer AG, Leverkusen, Fed. Rep. of Germany (D-5090)

Filed Mar. 9, 1977, Ser. No. 775,898

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610094

Int. Cl.[3] C09B *67/38;* D06P *1/645*

U.S. Cl. 8—524 7 Claims

1. Process for the preparation of pulverulent formulations suitable for use in transfer printing, which can be dispersed easily in organic media, of dyestuffs which are sublimable at 100°–230° C., wherein aqueous dispersions of said dyestuffs or aqueous solutions or dispersions of precursors of said dyestuffs are mixed with compounds of the formula

R—Z

wherein

R is C_{10}–C_{20}-alkyl, and

Z is NH_2, $NH(CH_2)_3$—NH_2 or OH, converting any of said precursors into the corresponding dyestuffs, and drying the resulting aqueous solution or dispersion into a dry pulverulent product.

4,295,850

COMMERCIAL PREPARATIONS OF DRY ORGANIC SUBSTANCES

Roland Häberli, Würenlingen; Hans Mollet, Reinach, and Gustaaf Scherer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 14,194, Feb. 22, 1978, abandoned, which is a continuation of Ser. No. 846,041, Oct. 27, 1977, abandoned, which is a continuation of Ser. No. 713,556, Aug. 11, 1976, abandoned, which is a continuation of Ser. No. 521,309, Nov. 6, 1974, abandoned. This application May 23, 1980, Ser. No. 152,951

Claims priority, application Switzerland, Nov. 13, 1973, 15962/73

Int. Cl.[3] D06P *67/02*

U.S. Cl. 8—524 6 Claims

1. Stable dust-free commercial preparations of organic substances, which preparations comprise an organic dyestuff, optical brightener or dyeing auxiliary substance in dry powder form enclosed in a covering having a thickness of 10 to 80μ, said covering forming a sack or bag sealed on all sides, made from polyethylene oxide having a molecular weight of more than 200,000.

4,295,851

PROCESS FOR THE PRODUCTION OF NEGLIGIBLY DUSTY PREPARATION

Konrad Neumann, Wyhlen; Ernst Schenkenberger, Rheinfelden, and Friedrich Resch, Lörrach, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 858,031, Dec. 6, 1977, abandoned. This application Jun. 17, 1980, Ser. No. 160,256

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1976, 2656408

Int. Cl.[3] C09B *67/06, 67/08, 67/24, 67/32*

U.S. Cl. 8—524 14 Claims

1. A process for the production of negligibly dusty preparations by spray drying an aqueous suspension consisting essentially of water, at least one water-soluble dye or optical brightner, at least one water-soluble adhesive containing at least five hydroxyl groups per molecule wherein said adhesive softens or melts in the temperature range of 30°–150° C., and in the presence or absence of diluting agents, dispersing agents, stabilisers against oxidative or reductive effects, pH-adjusting acids, bases or buffering agents; and wherein a dust-binding water-soluble surface-active agent is added to said aqueous suspension, or said dust-binding water-soluble surface-active agent is added to the spray-dried product, or partially to said aqueous suspension and partially to the spray-dried product.

4,295,852

PROCESS FOR DYEING POLYAMIDE FIBRES

Klaus Walz, Leverkusen, and Joachim Fiegel, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

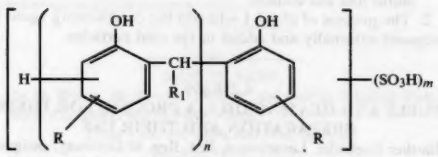
Filed Nov. 3, 1980, Ser. No. 202,907

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945102

Int. Cl.[3] D06P *3/24*

U.S. Cl. 8—560 3 Claims

1. Process for dyeing polyamide fibre materials with acid dyestuffs and/or metal complex dyestuffs, characterised in that the dyeing is carried out in the presence of compounds of the formula



in which

R represents a C_4–C_{12}-alkyl, C_1–C_{12}-alkoxy, phenyl, cyclohexyl or C_2–C_{10}-hydroxyalkoxy radical,

R_1 represents hydrogen or a C_1–C_4-alkyl radical,

n represents an integer from 1 to 10 and

m represents a number from 1 to n+1,

or water-soluble salts thereof.

4,295,853

METHOD FOR MEASURING PEROXIDIC SUBSTANCES

Shizuka Kasahara, Amagasaki; Kazuhiko Yamanishi, Tokyo; Toshiro Hanada; Kuniaki Tokuda, both of Kawagoe, and Shinzo Kobatake, Ibaraki, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 29, 1978, Ser. No. 974,148

Claims priority, application Japan, Dec. 29, 1977, 52-159070; Feb. 28, 1978, 53-22313

Int. Cl.³ G01N *31/22, 33/52, 33/92*

U.S. Cl. 23—230 B **8 Claims**

1. A method for determining lipoperoxides in a fluid sample obtained from a human being or other animal comprising:

(a) extracting a lipoperoxide from a sample of serum, blood plasma or blood with a solvent selected from the group consisting of a hydrocarbon, an alcohol, a halogenated hydrocarbo dimethylformamide, dimethylsulfoxide and N-methyl-pyrrolidone;

(b) contacting the extracted lipoperoxides with an oxidizable color reagent in the presence of a metallic compound produced from a metal which is able to have two or more valences to produce color; and

(c) measuring the degree of coloring.

4,295,854

APPARATUS AND METHODS FOR SAMPLE ENRICHMENT FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

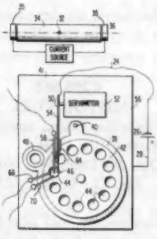
Bernhard Huber, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 78,367

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903246

Int. Cl.³ G01J *3/02;* **G01N** *31/02*

U.S. Cl. 23—230 PC **14 Claims**



1. A method of forming an atomic cloud of a looked-for element in a graphite tube through which a measuring beam of an atomic absorption spectrometer may be passed for the flameless atomic absorption spectroscopic measurement thereof, said method comprising the steps of:

inserting an electrode into a sample vessel containing a solution including said looked-for element;

passing an electric current through said solution to deposit components of said solution, including said looked-for element, on said electrode;

transferring said electrode having said looked-for element electrodeposited thereon from said sample vessel to said graphite tube such that said graphite tube and said electrode are in a heat transfer relationship, said transferring step including inserting said tip of said electrode carrying said electrodeposition into said graphite tube, via a lateral bore in the wall thereof, such that said tip is located inside said graphite tube; and

heating said graphite tube to a temperature whereat said components are atomized to form said atomic cloud.

4,295,855

METHOD FOR SEPARATING FIBRINOGEN AND ITS CONSTITUENT COMPONENTS

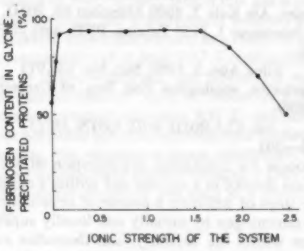
Susumu Sasaki, Nagoya; Kyoji Kito, Seto, and Akio Koide, Ichinomiya, all of Japan, assignors to Meito Sangyo Kabushiki Kaisha and Susumu Sasaki, both of Aichi, Japan

Filed Jan. 10, 1980, Ser. No. 110,946

Claims priority, application Japan, Jan. 16, 1979, 54/2162

Int. Cl.³ G01N *33/50, 33/68*

U.S. Cl. 23—230 B **14 Claims**



1. A method for obtaining fibrinogen or its constituent components, which comprises contacting a fibrinogen-containing composition with at least one aminocarboxylic acid of the formula

$$H_2N(CH_2)_nCO_2H \qquad (I)$$

wherein n is a positive integer,

in an aqueous medium in the presence of an ionic strength controlling agent capable of adjusting the ionic strength of the system to from about 0.02 to about 2.2 to collect at least one member selected from the group consisting of fibrinogen fraction 1 and fibrinogen fraction 2.

4,295,856

NITROSAMINE SPECIFICITY FOR ELECTROLYTIC CONDUCTIVITY DETECTOR

Rollen J. Anderson, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.

Filed Apr. 21, 1980, Ser. No. 141,900

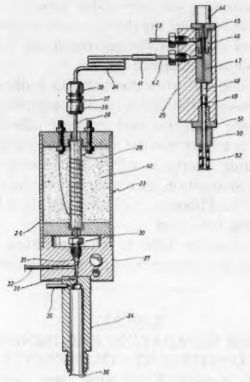
Int. Cl.³ G01N *31/08, 27/26*

U.S. Cl. 23—232 E **29 Claims**

1. A method for selectively pyrolyzing N-nitrosamines to ammonia from a sample containing other nitrogen compounds, which comprises:

contacting said sample with hydrogen at a temperature ranging from about 500° to about 700° C., in a non-

catalytic environment, which environment is free of nickel and is a reactor having a metallic surface exposed to



said sample during pyrolysis wherein said metal surface is gold or platinum.

4,295,857

PROCESS FOR THE CRYSTALLINE PRECIPITATION OF CHROMOGENS

Peter Schuler, Am Knie 7, 8000 München 60, BRD, and Erwin Braun, Unteranger 1, 8132 Tutzing, BRD, both of Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 136,911

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913889

Int. Cl.³ B01D *9/02*; G01N *33/15*

U.S. Cl. 23—301 **19 Claims**

1. A process for crystalline precipitation of a chromogen from solution thereof in a solvent and within a capillary, comprising the steps of initiating a course of crystalline precipitaton of the chromogen by initially and locally supersaturating the solution within the capillary, and thereafter evaporating the solvent at a rate and in an environment sufficient for further crystallization to proceed unimpeded by local supersaturation.

4,295,858

PROCESS FOR REMOVING SULFUR FROM COAL

Jui-Yuan Sun, South Holland; Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, Flossmoor, all of Ill., and George P. Masologites, Columbus, N.C., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 944,452, Sep. 21, 1978, Pat. No. 4,249,910. This application Mar. 3, 1980, Ser. No. 126,248

Int. Cl.³ C10L *9/02*

U.S. Cl. 44—1 SR **19 Claims**

1. A process for reducing the sulfur and ash content of coal comprising the steps of:

(1) contacting coal particles containing ash and iron pyrite mineral matter with a promoting amount of at least one conditioning agent, said conditioning agent having a ferrous component maintained at a pH of from about 5.5 to 11.0 and being capable of modifying or altering the existing surface characteristics of the pyrite under conditions to effectuate alteration of modification of at least a portion of the contained pyritic sulfur;

(2) agglomerating the coal particles while said pyrite surfaces are altered or modified in an aqueous medium with hydrocarbon oil to form coal-hydrocarbon oil agglomerates;

(3) separating said coal-hydrocarbon oil agglomerates from pyrite mineral matter and ash to recover coal-hydrocarbon oil agglomerates wherein the coal exhibits reduced sulfur and ash content.

2. The process of claim 1 wherein the conditioning agent is prepared externally and added to the coal particles.

4,295,859

FUELS AND HEATING OILS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Günther Boehmke, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 99,124

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854437

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—51 **6 Claims**

1. A fuel for a combustion engine or heating oil comprising a hydrocarbon, water and a non-ionic emulsifier, said non-ionic emulsifier containing less than 1,000 ppm of salt constituents and less than 1 percent by weight of polyalkylene glycol ethers.

4,295,860

MULTIFUNCTIONAL GASOLINE ADDITIVES

Michael E. Childs, Wilmette, Ill., assignor to UOP Inc., Des Plaines, Ill.

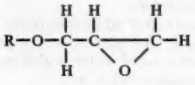
Filed Jun. 23, 1980, Ser. No. 161,828

Int. Cl.³ C10L *1/18, 1/22*

U.S. Cl. 44—63 **3 Claims**

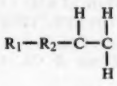
1. A composition comprising a major amount of a fuel oil and an additive consisting of from about 10 ppm up to 100 ppm of the reaction product of:

(a) a glycidyl ether presented by the formula:



wherein R is either

(i) a saturated hydrocarbyl group possessing from about 6 to about 20 carbon atoms or



(ii)

wherein R_1 and R_2 are saturated hydrocarbyl radicals containing from 1 to 17 carbon atoms and wherein the sum of R_1 and R_2 is from about 4 to about 18 carbon atoms

with

(b) an N-monosubstituted alkylenediamine having from 2 to about 8 carbon atoms in the alkylene moiety.

4,295,861

MOTOR FUEL

Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 24, 1980, Ser. No. 200,293

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—63 **9 Claims**

1. An internal combustion fuel composition comprising a major proportion of a motor fuel containing a small but effective amount, sufficient to impart reduced knocking tendencies to said motor fuel, of an ashless antiknock additive selected from the group consisting of 2-(dimethylaminomethyl)-3-hydroxypyridine (I), 2-(diethylaminomethyl)-3-hydroxypyridine (II), 2-(pyrolidinomethyl)-3-hydroxypyridine (III), 2-

(piperidinomethyl)-3-hydroxypyridine (IV), and 2-(morpholinomethyl)-3-hydroxypyridine (V).

4,295,862

MOTOR FUEL

Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 24, 1980, Ser. No. 200,292
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—72 **6 Claims**

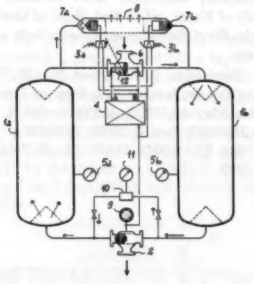
1. An internal combustion fuel composition comprising a major proportion of a motor fuel containing a small but effective amount, sufficient to impart reduced knocking tendencies to said motor fuel, of an ashless antiknock additive selected from the group consisting of (I) N-methylpropargylamine, (II) N-benzylpropargylamine, (III) N-phenylpropargylamine, (IV) dipropargylamine, and (V) N,N'-diethyl-2-butyne-1,4-diamine.

4,295,863

METHOD FOR AUTOMATING AND OPTIMIZING THE OPERATIVE CYCLE IN ADSORPTION DEHYDRATION PLANTS

Sergio Lattuada, Bergamo, Italy, assignor to S.T.I. Strumentazione Industriale S.p.A., Gorle, Italy

Filed May 27, 1980, Ser. No. 153,265
Claims priority, application Italy, Jun. 6, 1979, 2912 A/79
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—21 **2 Claims**



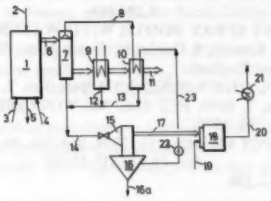
1. A method for automating and optimizing the steps of the working cycle in adsorption gas dehydration plants of the heatless regeneration type, having two tanks storing an adsorbing medium and alternating with each other in the function of adsorption and regeneration of the adsorbing medium, with a sequence of steps sequentially comprising the regeneration of the adsorbing medium in a tank by a small amount of dried gas drawn from the other tank that is in adsorption step, the repressurization of that tank which was in regeneration step and which is, therefore, brought to the same pressure as that of the tank that was in adsorption step, the exchange or reversal of the functions of the two tanks, whereby that tank that was in regeneration step is changed to adsorption step, while the tank that was in adsorption step is decompressed and then regenerated, repeating the above disclosed sequence, in which repressurization valves are provided for opening and closing at suitable time the passage to atmosphere, and the sequence and duration of the several steps are controlled by a programmer, wherein said operations of repressurization and reversal are effected upon a single pulse or control signal simultaneously requesting that the repressurization and reversal steps to be carried out, and wherein said single control signal for the repressurization and reversal steps is supplied to the servocontrol of a two- or three-way valve having an unbalanced type of shutter, in which the changeover of the shutter occurs only when a balance is provided between the force generated by the servocontrol and the force generated by the pressure differential acting upon the shutter, that is the pressure differential between the two tanks.

4,295,864

PROCESS OF TREATING PRESSURIZED CONDENSATE

Paul Rudolph, Bad Homburg, and Paul D. Becker, Eschborn, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 99,179
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853989
Int. Cl.³ B01D *53/14, 19/00*
U.S. Cl. 55—40 **5 Claims**



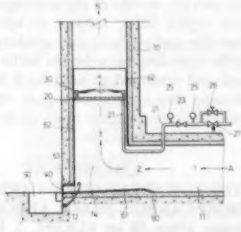
1. In a process of treating aqueous condensate which has been formed as a result of the cooling of raw gas produced by a gasification of a solid fuel by treatment with a gasifying agent which contains oxygen, water vapor and/or carbon dioxide under a pressure of 5 to 150 bars, which raw gas is cooled in at least one cooling stage, the improvement wherein at least part of said condensate which has formed as a result of the cooling and is at a temperature of at least 110° C. and a pressure of at least 2 bars is pressure-relieved, the flashed-off vapor is removed and said flashed-off vapor is burned in a combustion chamber at a temperature exceeding 800° C. and phenols, fatty acids and/or ammonia are removed from said flashed-off vapor by said burning, the pressure-relieved condensate is fed to a separator, and a condensate phase consisting mainly of water is withdrawn from the separator and used as a cooling fluid for the raw gas.

4,295,865

METHOD FOR REMOVING DUST FROM FLUE GASES

Wen-Shen Su, 9, Lane 29, Chung-Hau Rd., Cheng Hua City, Taiwan

Filed Sep. 24, 1979, Ser. No. 78,303
Int. Cl.³ B01D *47/06*
U.S. Cl. 55—84 **7 Claims**



1. A method for removing dust and noxious materials from flue gases within a tall chimney communicating with a flue, comprising the steps of:

forming mist layers above a location where said chimney communicates with said flue by spraying water with a spraying device assembly provided around the inner wall of said chimney;

heating a part of said mist layers to form saturated vapor layers by the latent heat of said flue gases;

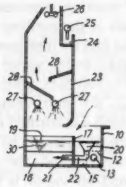
catching fine particles and noxious materials entrained in said flue gases which pass through the mist layers;
permitting condensed droplets from said mist layers to flow down to an inclined surface located at the bottom of said chimney to form a liquid-sludge;
discharging said liquid-sludge along said inclined surface through an outlet positioned at the lower end of said inclined surface into a precipitating vessel; and
inhibiting cold air from entering the chimney through said outlet by disposing a checkered plate at an opening for said outlet in a wall of said chimney
said method removing dust and noxious materials without appreciably affecting the normal ventilation of said chimney.

4,295,866

PAINT SPRAY BOOTH WITH WATER WASH

Thomas J. Kearny, 8 Oaklands, Green Lane, Malvern Wells, Worcester, England

PCT No. PCT/GB78/00022, § 371 Date Jun. 7, 1979, § 102(e) Date Jun. 7, 1979, PCT Pub. No. WO79/00209, PCT Pub. Date Apr. 19, 1979
PCT Filed Oct. 11, 1978, Ser. No. 46,475
Int. Cl.³ B01D *47/06*
U.S. Cl. 55—228 **10 Claims**



1. A paint spray booth installation comprising
a water tank,
pump means for withdrawing water from the tank,
a washing system for washing sprayed paint from the booth into the tank, said pump means feeding water to said washing system,
a baffle plate dividing the tank into two communicating regions, said baffle plate extending from one end wall of the tank over a major part of the width of the tank and from the bottom of the tank to a height sufficient to break the surface of the water,
an inlet for said pump means located near the said end wall in a first of said regions,
a surface removal device located close to the pump inlet and arranged to transfer floating paint from the vicinity of the pump inlet into the second of the said regions, the water in the second region being subject to agitation by water falling onto the surface from said washing system, and
a surface baffle extending between the baffle plate and a wall of the tank and arranged to hold back floating material while allowing free circulation below the surface baffle away from the second region towards the pump inlet.

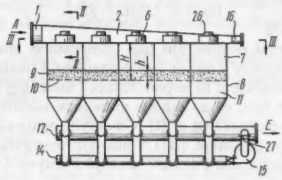
4,295,867

APPARATUS FOR SEPARATING CARBON BLACK FROM CARBON-BLACK AEROSOL

Viktor M. Shopin, ulitsa 50 let VLKSM, 3, kv. 8; Leonid G. Turenko, ulitsa ozero Khasan, 12; Vitaly F. Surovikin, ulitsa Lermontova, 20, kv. 80, and Konstantin V. Suponev, prospekt Mendeleeva, 11, kv. 40, all of Omsk, U.S.S.R.

Filed Jun. 8, 1979, Ser. No. 46,650
Int. Cl.³ B01D *41/02, 39/16*
U.S. Cl. 55—288 **7 Claims**

1. A filtering system for separating carbon black from a carbon-black aerosol, comprising: a plurality of compartments, each compartment partitioned by a fixed screen, having a mesh size ranging from about 50 to about 200 microns, into first and second chambers, each of said screens supporting a granular bed of carbon black grains arranged on said screen; the ratio of the height of the granular bed of carbon black grains to the height of said first chamber being within 0.1–0.5; an intake manifold, for admission of the carbon-black aerosol, communicating with each said first chambers; first shutoff means, an exit manifold, for a cleaned discharge gas, communicating with



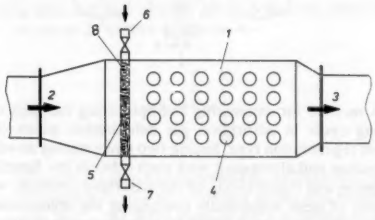
each of said second chambers and with said first shutoff means, second shutoff means; an entry manifold, for a regenerating gas, communicating with each of said second chambers, said exit manifold and with said second shut off means; blower means communicating with said exit manifold to enable said regenerating gas to flow from said exit manifold through said entry manifold.

4,295,868

FILTER FOR CLEANING HOT GASES

Heinz Hölter, Gladbeck; Heinz Gresch, Dortmund-Derne; Heinrich Igelbüscher, Gladbeck; Kurt Hübner, and Ekkehard Weber, both of Essen, all of Fed. Rep. of Germany, assignors to Industrie-Wert Beteiligungsgesellschaft mbH, Fed. Rep. of Germany

Filed Mar. 9, 1979, Ser. No. 19,371
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811641; May 22, 1978, 2822274; Jul. 5, 1978, 2829412; Jul. 5, 1978, 2829413; Sep. 4, 1978, 2838476
Int. Cl.³ B01D *27/30, 33/30, 39/06*
U.S. Cl. 55—302 **4 Claims**



1. An apparatus for cleaning hot gases comprising a filter housing having an inlet for unfiltered gas and an outlet for filtered gas, and a plurality of filter inserts placed within the housing in a manner capable of filtering undesirable components from the gas feed stream, each said filter insert comprising a fibrous filter material, the fibers consisting of silicic-acid glass fibers with a silicic-acid content of at least 90%, absorbed into the pores of which and coated upon which is a metal oxide of at least one of the group consisting of aluminum, titanium, zirconium, chromium, nickel, or cobalt, further comprising a cage of a honeycombed structure filled with expanded high temperature resistant perlite located within the housing between the gas inlet and the filter inserts, wherein the cage has an inlet and an outlet, both external to the housing, for effecting replacement of the perlite, and further comprising a combustion chamber mounted within said housing having a discharge nozzle located so that said nozzle is directed at the filter inserts, said combustion chamber having means for the insertion of combustible air connected thereto, whereby combust-

ing materials in the chamber causes an explosive backflow of gases through the filter inserts.

4,295,869

PROCESS FOR PRODUCING OPTICAL TRANSMISSION FIBER

Satoshi Shiraishi; Kunio Fujiwara, and Shiro Kurosaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

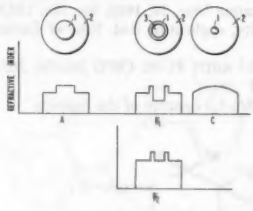
Continuation of Ser. No. 648,997, Jan. 14, 1976, Pat. No. 4,161,505, which is a division of Ser. No. 419,011, Nov. 26, 1973, abandoned. This application Feb. 8, 1979, Ser. No. 10,644

Claims priority, application Japan, Nov. 25, 1972, 47-118345; Nov. 25, 1972, 47-118346

The portion of the term of this patent subsequent to Jul. 17, 1996, has been disclaimed.

Int. Cl.[3] C03C *25/02*

U.S. Cl. 65—3.11 12 Claims



1. A process for producing an optical transmission fiber comprising depositing a doped fused silica layer containing F and then a fused silica layer on to the inner surface of a pipe of fused silica or water-repellant glass and melting and spinning said pipe into a fiber, said doped fused silica layers being formed by (A) oxidizing halides, hydrides or organic compounds of Si with OF_2 or oxygen containing a gaseous fluorine compound, or (B) by the oxidation of SiF_4 to form doped fused silica containing F and depositing said doped fused silica containing F as a layer.

4,295,870

PROCESS FOR THE PRODUCTION OF GLASS FOR A GLASS WORKPIECE FOR USE IN DRAWING A GLASS LIGHT CONDUCTING FIBER OF A LOW ATTENUATION

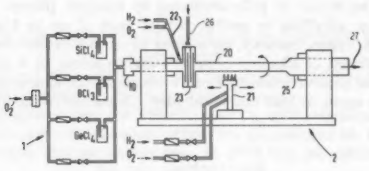
Ha :mut Schneider, and Egon Lebetzki, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 169,951

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935347

Int. Cl.[3] C03B *37/075*

U.S. Cl. 65—3.12 7 Claims



1. In a process for the production of a workpiece from which a glass fiber light waveguide of a low attenuation is drawn, said process comprising providing a body, providing a reaction gas, producing an amorphous glass powder from the reaction gas by a chemical reaction, precipitating said amorphous glass powder on the body, and subsequently transforming the precipitated powder into a clear glass layer, the improvement comprising the step of providing the reaction gas including the steps of providing a filter composed of a powder of amorphous glass of an identical nature to the amorphous glass being precipitated on the body from the chemical reaction of the reaction gas, and contacting the reaction gas with the powder of the filter prior to the step of producing the amorphous glass powder by the chemical reaction.

4,295,871

SIZING COMPOSITION AND GLASS FIBERS TREATED WITH THE AID OF SUCH COMPOSITION

Michel Droux, La Ravoire, and Gilbert Bocquet, Challes les Eaux, both of France, assignors to Saint-Gobain Industries, Paris, France

Filed Apr. 2, 1979, Ser. No. 26,430

Claims priority, application France, Apr. 3, 1978, 78 09726

Int. Cl.[3] C03C *25/02*

U.S. Cl. 65—3.41 4 Claims

1. In a method of manufacturing coated glass fiber comprising the following operations in sequence:

(a) mechanically drawing filaments of molten glass at high speed

(b) coating said filaments with an aqueous sizing composition

(c) collecting said coated glass filaments during the drawing operation in the form of strands which are wound into cakes, dried and then collected into roving slivers in the shape of a ball, or directly collected into ball-shaped rovings and dried;

the improvement which comprises coating the filaments with an aqueous sizing composition comprising a system of cross-linking adhesive agents consisting essentially of at least one compound having a number of functional groups which are N-methylol functions or N-CH_2OR functions or both, with R being an alkyl radical, at least one acrylic polymer which may be modified or unmodified, and an amino-alkoxy-silane.

4,295,872

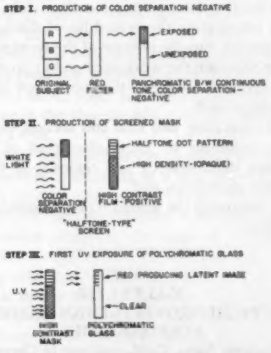
PRODUCING A MULTI-COLOR IMAGE IN POLYCHROMATIC GLASS

George A. Luers, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 10, 1980, Ser. No. 128,831

Int. Cl.[3] C03B *25/00, 32/00;* C03C *3/22, 3/26*

U.S. Cl. 65—30.11 14 Claims



11. An improved method of producing a multicolor image in polychromatic glass wherein the glass is initially exposed to develop a latent image, then heat treated to develop nuclei, and thereafter further exposed and heat treated to develop a full color image, characterized in that the initial exposure is made

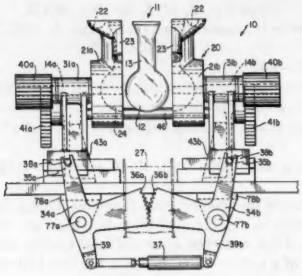
through at least one high contrast film positive embodying a subject pattern in the form of a half tone transparency, and being further characterized by the fact that the glass is melted under reducing conditions so that opal formation occurs in unexposed areas of the glass.

4,295,873

METHOD AND APPARATUS FOR REWORKING A HOLLOW WORKPIECE

Donald G. Trutner, Chatham, N.J., and Luke Thorington, Easton, Pa., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Apr. 12, 1979, Ser. No. 29,310
Int. Cl.³ C03B *23/00*
U.S. Cl. 65—108 **27 Claims**



1. A method of reworking a hollow workpiece comprising the steps of

providing a first fluid of temperature sufficient to soften said workpiece,

placing said workpiece within the cavity of a mold, and

introducing said first fluid into the interior of said workpiece to soften said workpiece, said first fluid of sufficient density so that the static pressure thereof forces said softened workpiece into contact with the interior surface of said mold.

13. Apparatus for reworking a hollow workpiece having an opening therein comprising means defining first and second joinable mold portions, the interior portions thereof aligned upon joining to define a mold cavity for receiving therein said hollow workpiece,

a source of liquid,

means for heating the liquid to a molten state,

means for introducing the heated liquid through the workpiece opening into the interior of the workpiece at a temperature to soften the workpiece and to produce a hydrostatic pressure to expand the workpiece into the mold cavity shape, and

means for separating said first and second mold portion a distance sufficient to allow placement of the original workpiece therebetween and removal of the expanded workpiece therefrom, and

means for removing the heated liquid contained within said workpiece.

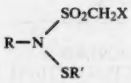
4,295,874

N-ALKYL OR ARYL-N-(TRICHLOROVINYLTHIO)-HALOMETHANE SULFONAMIDES

Laroy H. Edwards, Napa, Calif., assignor to Chevron Research, San Francisco, Calif.

Filed Jan. 28, 1980, Ser. No. 115,590
Int. Cl.³ A01N *33/00, 59/02;* C07C *143/74*
U.S. Cl. 71—67 **9 Claims**

1. A compound of the formula



(I)

wherein R is alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 to 8 carbon atoms substituted with up to 2 alkyl of 1 to 3 carbon atoms, or phenyl substituted with up to 2 fluoro, chloro, bromo, iodo or alkyl of 1 to 4 carbon atoms; X is fluoro, chloro, bromo or iodo and R′ is trichlorovinyl.

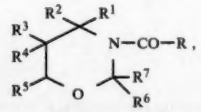
4,295,875

TETRAHYDRO-1,3-OXAZINES

Karl Eicken, Wachenheim; Wolfgang Rohr, Mannheim; Hans J. Pander, Roedersheim-Gronau, and Bruno Wuerzer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 57,129, Jul. 12, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 132,986
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1978, 2832890
Int. Cl.³ A01N *43/86;* C07D *265/04, 265/12*
U.S. Cl. 71—88 **10 Claims**

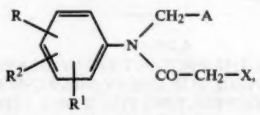
1. A tetrahydro-1,3-oxazine of the formula



II

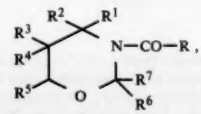
where R denotes linear or branched haloalkyl of up to 3 carbon atoms, R^1, R^2, R^3, R^4 and R^5 are identical or different and each denotes hydrogen or linear or branched alkyl of up to 3 carbon atoms, R^6 denotes hydrogen, or R^7 denotes hydrogen.

4. A herbicidal agent comprising, as herbicidal active ingredient, at least one substituted acetanilide of the formula



I

where R denotes hydrogen, linear or branched alkyl or alkoxy of up to 5 carbon atoms, R^1 denotes hydrogen, halogen, or linear or branched alkyl or alkoxy of up to 5 carbon atoms, R^2 denotes hydrogen, halogen, or linear or branched alkyl or alkoxy of up to 5 carbon atoms, R together with R^2 denotes an alkylene chain of up to 6 carbon atoms which is linked in the o-position and may be substituted by linear or branched alkyl of up to 4 carbon atoms, X denotes chlorine or bromine, and A denotes azole which is attached via a ring nitrogen atom and may be mono- or polysubstituted by halogen, phenyl, alkyl, alkoxy, alkylthio or perfluoroalkyl, each of up to 4 carbon atoms, cyano, carboxy, carbalkoxy of up to 4 carbon atoms in the alkoxy, or alkanoyl of up to 4 carbon atoms, or A denotes salts of azoles containing 2 or 3 nitrogen atoms, and, as antagonistic agent, at least one tetrahydro-1,3-oxazine of the formula



II

where R denotes linear or branched haloalkyl of up to 3 carbon atoms, R^1, R^2, R^3, R^4 and R^5 are identical or different and each denotes hydrogen or linear or branched alkyl of up to 3 carbon atoms, R^6 denotes hydrogen, or R^7 denotes hydrogen.

4,295,876

N-(2,5-DIAZOLYL)-ALKYL-HALOACETANILIDES, COMPOUNDS AND HERBICIDAL COMPOSITIONS

Jörg Stetter; Klaus Ditgens; Rudolf Thomas, all of Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

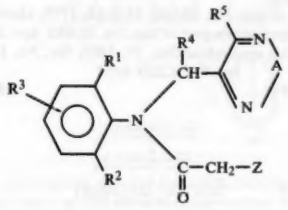
Filed Apr. 23, 1980, Ser. No. 143,053

Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919293

Int. Cl.³ A01N *43/64, 43/82;* **C07D** *249/04, 271/08*

U.S. Cl. 71—90 **38 Claims**

1. N-(2,5-diazolyl) alkyl-haloacetanilide compounds of the formula



(I)

wherein

A is oxygen, sulfur or the grouping >N-R in which R is alkyl with up to 4 carbon atoms;

R^1 is hydrogen, alkyl with up to 4 carbon atoms, or alkoxy with up to 4 carbon atoms;

R^2 is hydrogen, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, or fluorine, chlorine, or bromine;

R^3 is hydrogen, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, or fluorine, chlorine or bromine;

R^4 is hydrogen or alkyl with up to 4 carbon atoms;

R^5 is hydrogen, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, dialkylamino with up to 4 carbon atoms in each alkyl group, fluorine, chlorine or bromine, cyano or alkoxycarbonyl with up to 4 carbon atoms in the alkoxy group; and

Z is chlorine, bromine or iodine.

32. Herbicidal composition comprising a herbicidally acceptable carrier and, in herbicidally effective amounts, an N-(2,5-diazolyl)alkyl-haloacetanilide compound as claimed in claim **1**.

4,295,877

SELECTIVE HERBICIDAL METHOD IN COTTON AND SOYBEANS

Andre Thizy; Pierre Poignant, and Daniel Pillon, all of Lyons, France, assignors to Philagro, Lyons, France

Continuation of Ser. No. 809,903, Jun. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 162,643, Jul. 14, 1971, abandoned. This application Dec. 13, 1978, Ser. No. 969,003

Int. Cl.³ A01N *47/30*

U.S. Cl. 71—120 **8 Claims**

1. A method for weed control in dicotyledonous crops comprising pre-emergence and post-emergence application of a herbicidally effective amount of N-(4-isopropylphenyl)-N',N'-dimethylurea to a dicotyledonous crop selected from the group consisting of soybeans and cotton.

4,295,878

PROCESSES OF IRON SEGREGATION

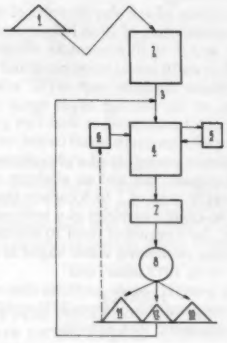
Donald J. Fensom, South Yarra, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Continuation of Ser. No. 922,351, Jul. 6, 1978, abandoned. This application Oct. 10, 1979, Ser. No. 83,516

Claims priority, application Australia, Jul. 8, 1977, PD0750

Int. Cl.³ C22B *1/8*

U.S. Cl. 75—1 T **16 Claims**



1. A process for the beneficiation of particles of titaniferous material comprising as a first component titanium oxide and as a second component metallic iron, said first and second components being in intimate association in said particles which process comprises first subjecting said particles to a non-oxidizing environment, said environment being characterized in that it is at an elevated temperature and comprises vapour derived from an iron chloride salt so that at least part of the said metallic iron is segregated by translocation from within said particles to the outside of said particles and secondly in a separation step separating the thus segregated metallic iron and relicts of said particles, wherein the particles of titaniferous material are the product of reduction of ores comprising iron titanium oxides, and substantially all of the iron component is reduced to the metallic state, wherein the elevated temperature used in said segregation step is in a range from the melting point of the iron salt to 1000° C., and wherein said segregation step takes place in the absence of a solid carbonaceous reducing agent and a flux.

2. A process for the beneficiation of pre-reduced particles of titaniferous material comprising as a first component titanium oxide and as a second component metallic iron, said first and second components being in intimate association in said particles which process comprises the steps of: (i) segregating at least part of said metallic iron from said pre-reduced particles by contacting said pre-reduced particles in a non-oxidizing environment at an elevated temperature with vapour derived from an iron chloride salt, whereby segregated metallic iron is translocated from within said particles to the outside of said particles; and (ii) separating the thus segregated metallic iron and relicts of said particles, wherein the elevated temperature used in said segregation step (i) is in a range from the melting point of the iron salt to 800° C.

3. A process according to claim **2** wherein said titaniferous material is ilmenite.

4,295,879
MANUFACTURE OF ACICULAR FERROMAGNETIC IRON PARTICLES

Werner Steck, Mutterstadt; Wilhelm Sarnecki, Limburgerhof; Laszlo Marosi, Ludwigshafen; Manfred Ohlinger, Frankenthal, and Horst Autzen, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 31, 1980, Ser. No. 174,240

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935357

Int. Cl.³ B22F *9/00*

U.S. Cl. 75—0.5 AA **2 Claims**

1. A process for the manufacture of acicular ferromagnetic iron particles, comprising:

(a) coating the surface of acicular particles of iron(III) oxide hydroxide and consisting of 20 to 100 percent by weight of lepidocrocite and 0 to 80 percent by weight of geothite with an alkaline earth metal compound and a monobasic, dibasic or tribasic aliphatic carboxylic acid of up to 6 carbon atoms, or an alkaline earth metal chelate of an organic compound containing at least two groups capable of chelating an alkaline earth metal cation, or a hydrolysis-resistant substance consisting of a phosphorus oxyacid, its ester or its inorganic salt and an aliphatic mono-, di- or tribasic carboxylic acid of 1 to 6 carbon atoms,

(b) heating the so-coated particles at a temperature of from 250° to 390° C. for a period of from 10 minutes to 10 hours in an atmosphere containing water vapor at a partial pressure of from 30 to 1013 mbar, and

(c) reducing the iron(III) oxide particles thus obtained with hydrogen at temperatures of from 275° to 425° C. to form acicular ferromagnetic iron particles.

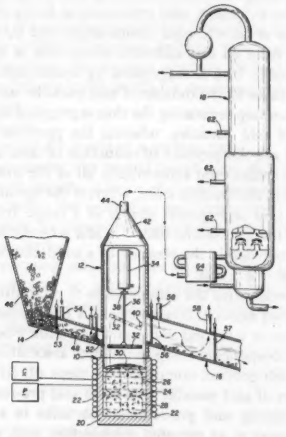
4,295,880
APPARATUS AND METHOD FOR RECOVERING ORGANIC AND NON-FERROUS METAL PRODUCTS FROM SHALE AND ORE BEARING ROCK

John W. Horner, Jr., 150 Martin St., Longmont, Colo. 80501

Filed Apr. 29, 1980, Ser. No. 144,831

Int. Cl.³ C22B *4/00*

U.S. Cl. 75—10 R **16 Claims**



1. An apparatus for extracting organic products from mineral raw materials, comprising:

an electric induction furnace of the type having a refractory crucible and capable of maintaining a charge of non-ferrous metal in a molten state with natural induction stirring thereof;

an extraction chamber closing said induction furnace crucible against free entry of oxygen and providing a space above the crucible for receiving a batch of mineral raw material to be processed;

a fractionating tower means for collecting organic vapors that, in use, may be generated from mineral raw material by the furnace;

a connecting means for directing organic vapors from the extraction chamber to the fractionating tower means;

skimming means for removing processed mineral raw material from the crucible charge and extraction chamber;

intake means for delivering mineral raw material to the crucible;

outlet means for receiving spent raw material from said skimming means and discharging the raw material from the extraction chamber; and

means for substantially preventing oxygen entry during inlet and discharge of the raw material.

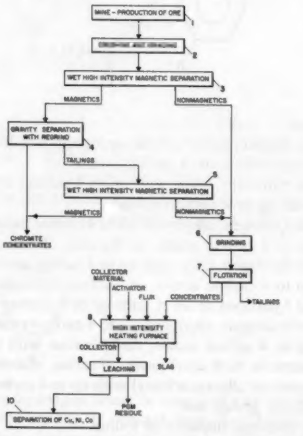
4,295,881
PROCESS FOR EXTRACTION OF PLATINUM GROUP METALS FROM CHROMITE-BEARING ORE

James Saville, Stamford, Conn., assignor to Texasgulf Inc., Stamford, Conn.

Continuation of Ser. No. 38,820, May 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 32,680, Apr. 23, 1979, abandoned. This application Jun. 10, 1980, Ser. No. 158,184

Int. Cl.³ C22B *4/04*

U.S. Cl. 75—10 R **18 Claims**



1. A process for recovering platinum group metals from chromite-bearing ores, comprising the steps of:

(a) subdividing chromite-bearing ore containing one or more platinum group metals;

(b) subjecting a slurry of said subdivided ore to high intensity magnetic force to separate said ore into a magnetic fraction containing a substantial quantity of the chromite originally present in the ore and a non-magnetic fraction containing a substantial quantity of the platinum group metals originally present in the ore;

(c) subjecting said non-magnetic ore fraction containing a substantial quantity of the platinum group metals originally present in the ore to a flotation process to produce a concentrated fraction containing platinum group metals;

(d) smelting the concentrate in a high intensity heating furnace in the presence of one or more collector materials for the platinum group metals to produce a slag layer and collector material layer containing the platinum group metals in association with said collector metal;

(e) separating said collector material from said slag layers; and

(f) separating platinum group metal from the collector material layer.

4,295,882

STEEL MAKING PROCESS

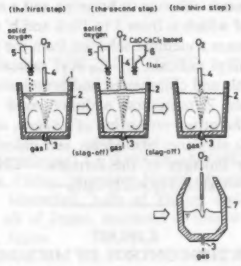
Ryoji Arima, Kobe; Kazushige Umezawa, and Tokuzo Nisugi, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,255

Claims priority, application Japan, Oct. 24, 1978, 53-130039; Nov. 2, 1978, 53-134584; Dec. 15, 1978, 53-154769; Dec. 30, 1978, 53-162538; Dec. 30, 1978, 53-162539; Jan. 13, 1979, 54-1780

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—52 **16 Claims**



1. A steelmaking process for desiliconizing, dephosphorizing, desulfurizing and decarburizing molten iron from a blast furnace, comprising the following sequence of steps:

(1) a first step of agitating the molten iron in a vessel, supplying the molten iron with both gaseous oxygen and, an iron oxide contanitive material reducing the Si content in the iron to a value between 0.05 and 0.20% at a controlled bath temperature between 1480 and 1480° C., and discharging the resulting slag;

(2) a second step of agitating the molten iron from the first step having a bath temperature between 1380° and 1380° C., supplying the molten iron with a flux consisting essentially of CaO and 0.2 to 0.5 parts by weight of $CaCl_2$ or KCl or both $CaCl_2$ and KCl per part by weight of CaO and a source of oxygen, maintaining the basicity of the processing slag between 3.5 and 8.0 and the T.Fe value between 3 and 10%, desulfurizing and dephosphorizing the iron with the same slag to reduce the P, S and Si contents to no higher than 0.025%, 0.020% and a trace, respectively, and to hold the C content not lower than 3.8%, and discharging the resulting slag; and

(3) a third step of decarburizing the molten iron from the second step by blowing oxygen onto the melt without using a refining flux.

4,295,883

DEVICE AND METHOD FOR INTRODUCING GASES INTO MOLTEN METAL

Rajko Lajh, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

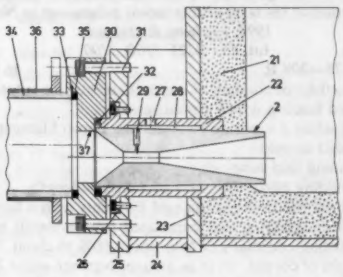
Filed Jun. 26, 1980, Ser. No. 163,177

Claims priority, application Switzerland, Jul. 10, 1979, 6447/79

Int. Cl.³ C22C *1/02*

U.S. Cl. 75—68 R **13 Claims**

1. A device for introducing gas into a metal melt comprising a fluid/gas-jet-mixing facility having a converging conical inlet, a cylindrical hollow center piece having a passageway of substantially constant diameter and a diverging conical outlet all disposed sequentially along a first axis, said cylindrical hollow center piece being provided with a plurality of channels for passing a gas to said passage, first feeding means for feeding said melt to said converging conical inlet and into said passage such that said melt sucks said gas through said channels and into said passage for mixing said gas with said melt in said passage wherein the angle of said diverging conical outlet measured from said first axis is equal to about 7° to 15°, the



ratio of the diameter of said passage to the maximum diameter of both said converging conical inlet and said diverging conical outlet is about 1:4 to 1:6 and the ratio of the length of said converging conical inlet plus the length of said passage to the length of said diverging conical outlet is about 1:5 to 1:8.

4,295,884

PROCESS FOR TREATING A MOLTEN METAL OR ALLOY USING LIQUID AND SOLID FLUX

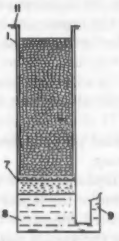
Jean-Marie Hicter, Coublevie-Voiron, and Pierre Guerit, Chambery, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Jul. 26, 1979, Ser. No. 61,023

Claims priority, application France, Jul. 31, 1978, 78 23197

Int. Cl.³ C22B *9/12, 21/06*

U.S. Cl. 75—93 R **6 Claims**



1. A process for treating molten metal for the removal of inclusions by means of liquid and solid metal halide-based fluxes comprising the steps of:

establishing in a column having an inlet end and an outlet end a complex treatment bed comprising a packing of granules at least in part comprising solid flux supported upstream of the column outlet and immersed in a bath of liquid flux, the melting point of the solid flux being higher than the melting temperature of the liquid flux and the temperature of the molten metal to be treated;

establishing downstream and adjacent the supported end of the solid flux granules a molten metal droplet coalescence zone comprising liquid flux;

passing molten metal as a dispersion of droplets through the liquid flux-immersed solid flux granules and into the coalescence zone while maintaining the granules immersed in liquid flux; and

recovering treated coalesced molten metal.

4,295,885

MATERIAL AND METHOD FOR SECURING BORON FILAMENTS TO EACH OTHER AND TO A SUBSTRATE AND CUTTING TOOLS THEREFROM

William T. Kaarlela, Fort Worth, Tex.

Division of Ser. No. 644,005, Dec. 24, 1975. This application Sep. 11, 1978, Ser. No. 941,513

The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.

Int. Cl.[3] **B22F** *1/00, 3/00*

U.S. Cl. 75—208 R **16 Claims**

1. A method of bonding of boron filaments to a substrate by a modified brazing which comprises:

A. providing a substrate for receiving boron filaments to be bonded thereto;

B. cleaning said substrate;

C. providing boron filaments of a desired length;

D. at least partially coating said filaments with a liquidized metals containing slip formulated from a metals mixture consisting essentially of from about 60% to about 75% by weight of copper, tin in an amount between about 20% to 35% by weight, the remainder being essentially titanium;

E. said slip being further prepared from about 4 parts of the copper, tin and titanium mixture to about 1 part of about a ½% to about a 1% liquid solution of a suspension agent for holding said metals mixture in suspension in said solution;

F. placing said at least partially coated filaments on said substrate;

G. drying said coated filaments;

H. bonding said coated filaments to said substrate by liquid-phase-sintering; and

I. cooling said coated filaments on said substrate.

9. A method of bonding together a plurality of boron filaments to hold them fixed in an alloy metal matrix which comprises:

A. providing boron filaments of a desired length;

B. at least partially coating said filaments with a liquidized metals containing slip formulated from a metals mixture consisting essentially of from about 60% to about 75% by weight of copper, tin in an amount between about 20% to 35% by weight, the remainder being essentially titanium;

C. said slip being further prepared from about 4 parts of the copper, tin and titanium mixture to about 1 part of about a ½% to about a 1% solution containing a suspension agent for holding said metals mixture in suspension in said solution;

D. placing said at least partially coated filaments juxtaposed together in a group;

E. drying said juxtaposed group of coated filaments to at least partially remove the liquid vehicle of said solution;

F. bonding said coated filaments together by liquid-phase-sintering to alloy the metals mixture about the filaments; and

G. cooling said filaments and said metals.

4,295,886

FLAME-RETARDANT POLYESTER FIBER COMPOSITIONS

John T. Gresham, Somerset, N.J., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Filed Oct. 9, 1973, Ser. No. 404,198

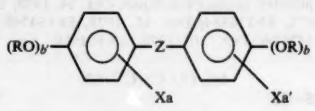
Int. Cl.[3] **C08K** *5/53*

U.S. Cl. 106—18.19 **8 Claims**

6. Flame retardant yarns and fabrics comprising a combination of the flame-retardant polyester fiber composition and a member of the group consisting of cotton, rayon, nylon, acetate and acrylic fibers, and further comprising from about 95 to 80 parts by weight of the fiber-forming polyester which is a member of the group consisting of poly(ethylene terephthalate), poly (1,4-cyclohexylenedimethylene terephthalate) and poly (ethylene 2,6-naphthalenedicarboxylate), and 5 to 20 parts by weight of a two-component flame-retardant additive consisting essentially of, by weight:

(a) from about 20 to 80% of 3,9-diphenyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide, and

(b) from about 80 to 20% of a polychlorinated or polybrominated diaryl compound containing at least 40% by weight chlorine or bromine and having the general formula



where X represents chlorine or bromine and a and a' are integers, the sum of which is from 3 to 10; b and b' represent zero and 1; R represents a member selected from the group consisting of C_1–C_4 alkyl radicals, C_1–C_4 acyl radicals, phenyl and benezoyl radicals and chlorinated and brominated phenyl and benzoyl radicals; Z represents a direct bond or a member selected from the group consisting of oxygen, carbonyldioxy, sulfonyl, C_1–C_4 alkylene, phenylene, and chlorinated phenylene, and ether linkages of the formula $—CH_2O—$, $—CH_2OCH_2—$ and $—C_6H_4CH_2OCH_2C_6H_4—$.

4,295,887

METHOD FOR THE CONTROL OF MICRO-ORGANISMS

Alan J. Buckley, and Michael Singer, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 922,361, Jul. 5, 1978, abandoned, which is a continuation of Ser. No. 841,908, Oct. 13, 1977, abandoned, which is a continuation of Ser. No. 667,439, Mar. 16, 1976, abandoned. This application Jun. 25, 1979, Ser. No. 51,853

Claims priority, application United Kingdom, Apr. 10, 1975, 14795/75

Int. Cl.[3] **C08K** *5/16, 5/36;* **C09D** *5/14*

U.S. Cl. 106—18.33 **3 Claims**

1. A water-based paint or adhesive which is susceptible to infection with Pullularia pullulans when applied to a substrate, and which has been protected against infection by Pullularia pullulans and other microorganisms by adding to the paint or adhesive an effective amount, in the range 1 to 10,000 parts per million based on the weight of the paint or adhesive, of 2,2'bis-(methylaminocarbonyl)diphenyldisulfide, said paint or adhesive being in a container.

4,295,888

SOLVENT COMPOSITIONS

Gillian M. Greenwood, and Alan Woodstock, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 27, 1976, Ser. No. 757,776

Claims priority, application United Kingdom, Jan. 19, 1976, 1999/76

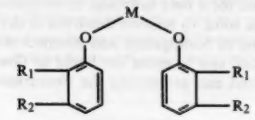
Int. Cl.[3] **C09D** *11/00*

U.S. Cl. 106—21 **11 Claims**

1. A composition comprising a chlorinated substantially straight chain paraffin solvent having a range of carbon atoms between 7 and 35 and of chlorine content 10% by weight to 72% by weight, a compound capable of colour forming on contact with an electron-acceptive substance, an antioxidant for said chlorinated paraffin solvent, and at least one of the following adjuvants present in said solvent in amount sufficient to at least reduce the tendency of the solution of paraffin, antioxidant and colour-forming compound to discolor:

(a) a barium, calcium or magnesium sulphonate;

(b) a barium, calcium or magnesium phenate of the structure:



where M is an atom of barium, calcium or magnesium, R_1 is hydrogen or an alkyl group containing 1 to 10 carbon atoms and R_2 is an alkyl group containing 1 to 10 carbon atoms; and

(c) a nitrogen containing derivative of an alkenyl succinic anhydride, said derivative being obtained by the reaction of polyisobutylene with maleic anhydride followed by further reaction with tetraethylene pentamine.

4,295,889

RECORDING LIQUID COMPOSITION

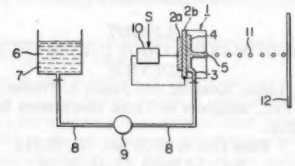
Tsuyoshi Eida, Chiba; Masahiro Haruta, Funabashi; Yasuhiro Yano; Yoji Matsufuji, both of Tokyo, and Tokuya Ohta, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 97,920

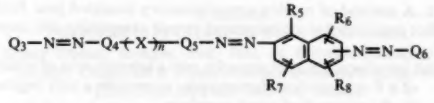
Claims priority, application Japan, Dec. 1, 1978, 53-148679; Jun. 22, 1979, 54-78952; Jun. 22, 1979, 54-78953; Sep. 11, 1979, 54-116427

Int. Cl.³ C09D *11/00*

U.S. Cl. 106—22 **30 Claims**



1. A recording liquid composition for use in a recording system of the type in which the recording liquid composition is jetted from a small orifice in a form of droplet flying toward a recording material on which an image is to be printed, said recording liquid composition comprising, as its recording agent component, a compound of the general formula (B):



(B)

wherein

Q_3 and Q_6 each represents a substituted or unsubstituted phenyl or naphthl group; Q_4 and Q_5 each represents a substituted or unsubstituted 1,4-phenylene or 1,4-naphthylene group;

R_5 and R_6 are selected from hydrogen, hydroxyl and amino group;

R_7 and R_8 each represents hydrogen atom or sulfo group in a form of sodium salt or quaternary ammonium salt;

X is —NH—, —N=N— or —CH=CH— and

n is 0 or 1 provided that when n is 0, Q_4 and Q_5 are not unsubstituted 1,4-phenylene at the same time.

4,295,890

SUBMICRON BETA SILICON CARBIDE POWDER AND SINTERED ARTICLES OF HIGH DENSITY PREPARED THEREFROM

Frederick G. Stroke, McMurray, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 637,342, Dec. 3, 1975, abandoned. This application Oct. 31, 1977, Ser. No. 847,347

Int. Cl.³ C04B *35/56*

U.S. Cl. 501—90 **25 Claims**

1. A substantially pure submicron boron-containing beta silicon carbide powder composition consisting essentially of silicon carbide powder substantially all of the beta crystalline form, said powder having a surface area of between about 3 and about 15 square meters per gram, the number mean particle size of the silicon carbide particles comprising the powder being between 0.08 and 0.8 microns, coformed homogeneously distributed boron-containing additive in an amount equivalent to between 0.15 and 0.25 weight percent boron, based on the silicon carbide, and between 0.05 and 1.5 weight percent free carbon, based on the silicon carbide.

4,295,891

BLANKET POWDER FOR COVERING A MOLTEN METAL BATH

Jean-Charles Daussan; Gerard Daussan, both of Metz, and André Daussan, Longeville les Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

Filed Aug. 5, 1980, Ser. No. 175,680

Claims priority, application France, May 16, 1980, 80 10983

Int. Cl.³ C04B *35/52*

U.S. Cl. 501—99 **9 Claims**

1. A blanket powder for covering a molten metal bath, comprising a cereal-hull ash, wherein said powder further contains approximately 5 to 50% by weight of non-calcined cereal hulls.

4,295,892

CORDIERITE CERAMIC HONEYCOMB AND A METHOD FOR PRODUCING THE SAME

Tadaaki Matsuhisa; Shigeo Soejima, and Noboru Yamamoto, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 772,953, Feb. 28, 1977, abandoned, which is a continuation of Ser. No. 674,933, Apr. 8, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,485

Int. Cl.³ C04B *35/18*

U.S. Cl. 501—120 **3 Claims**

1. Cordierite ceramic honeycomb having a softening shrinkage at 1,450° C. of not more than 0.5% which consists mainly of cordierite in crystal phase and contains 8 to 20% by weight of at least one crystal selected from the group consisting of spinel, mullite and corundum has a thermal expansion coefficient at a temperature range of 25°–1,000° C. being not more than 22×10^{-7}(1/°C.).

4,295,893

ALUMINA-CONTAINING CALCIUM SILICATE AND PROCESS FOR PRODUCING SAME

Akira Takahashi, and Kenichi Oohashi, both of Gifu, Japan, assignors to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan

Filed Nov. 15, 1979, Ser. No. 94,500

Int. Cl.³ C04B *7/02*

U.S. Cl. 106—120 **21 Claims**

1. Super-lightweight secondary particles of alumina-containing calcium silicate characterized in that the particles are composed of alumina-containing calcium silicate crystals having an index of crystallite antigrowth of at least 8 and interlocked with one another in the form of a globular shell, the particles being about 5 to about 70 μm in diameter, up to about 0.13

g/cm^3 in apparent density and at least 10 g per particle in initial breaking load.

4,295,894

METHOD OF PREPARING SOLUBLE COLLAGEN FIBERS

Gheorge Cioca, Belleville, and Marcel Siegler, North Bergen, both of N.J., assignors to Seton Company, Newark, N.J.

Filed Nov. 19, 1979, Ser. No. 95,391
Int. Cl.^{3} C08L *89/06;* C08K *3/24, 3/20, 3/30*
U.S. Cl. 106—155 **16 Claims**

1. A method of forming soluble collagen fiber from a raw animal hide comprising:

treating a raw hide with an aqueous solution of an alkali metal hydroxide and an organic dehydrating agent to remove the hair and fat therefrom, to yield a substantially hair and fat-free corium;

stabilizing the interfibular bonds of the collagen in the corium with an aqueous solution of an alkali sulfate;

neutralizing the corium;

dissolving the corium in an aqueous acid solution to yield a collagen solution;

precipitating collagen fibers from the solution; and

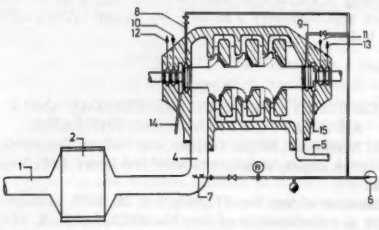
drying the collagen fibers.

4,295,895

METHOD FOR STEAM CLEANING OF COMPRESSORS

Gunnar Kongshaug, Porsgrunn, Norway, assignor to Norsk Hydro a.s., Oslo, Norway

Filed Mar. 28, 1980, Ser. No. 136,070
Int. Cl.^{3} B08B *3/00*
U.S. Cl. 134—22 R **8 Claims**



1. In a method for removing and preventing the formation of salt deposits in critical sections of a plant where process gases containing impurities including ammonium nitrate are transferred and compressed, the improvement which comprises supplying steam to said sections in such amounts that a water vapour pressure is established in excess of the saturated water vapour pressure above the salt deposits at the existing temperatures.

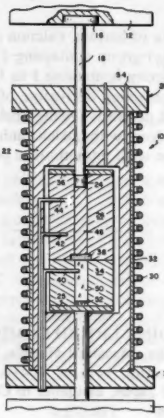
4,295,896

METHOD FOR MAKING METAL ALLOY COMPOSITIONS AND COMPOSITION

Merton C. Flemings, and Frank E. Goodwin, both of Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 20,101, Mar. 12, 1979, abandoned. This application May 14, 1979, Ser. No. 39,226
Int. Cl.^{3} C22F *1/04*
U.S. Cl. 148—1 **34 Claims**

1. The process for forming a metal alloy composition free of oxide inclusions, free of porosity and containing solutes derived from said alloy composition in an amount greater than 90 weight percent of the amount soluble at the temperature of maximum solubility and containing less than 2 volume percent of undissolved second phase which comprises heating a first alloy from the nonequilibrium solidus temperature to form a solid-liquid composition, subjecting said solid-liquid composition to pressure for a time sufficient to overcome the inherent strength of the solid, to convert dendrites in the solid to a fine grain structure, to homogenize and compact the composition of the dendrites, and to cause the liquid to flow through and out of said solid and preventing the formation of secondary



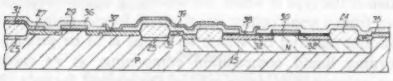
phase material either by rapidly quenching said solid or by cooling said solid followed by heat treating said cooled solid at a temperature less than that at which liquid metal from said alloy forms for a period of time to dissolve substantially all said secondary phase into said primary phase and rapidly quenching said heat treated solid to form a cooled solid.

4,295,897

METHOD OF MAKING CMOS INTEGRATED CIRCUIT DEVICE

Graham S. Tubbs, Houston, and James E. Ponder, Cat Spring, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 3, 1979, Ser. No. 81,513
Int. Cl.^{3} H01L *21/22, 29/78*
U.S. Cl. 148—1.5 **4 Claims**



1. A method of making complementary insulated gate field effect transistors in an integrated circuit comprising the steps of:

(a) introducing N-type impurity into a selected area of a face of a P-type semiconductor body to provide a tank region for forming a P-channel transistor,

(b) selectively growing thick field oxide using an oxidation mask to provide a first enclosed surface area on said face spaced from said tank region and a second enclosed surface area on said face within said tank region,

(c) depositing a layer of polycrystalline silicon on said face over a thin gate insulator and patterning the polycrystalline silicon to provide a gate of an N-channel transistor in said first surface area and a gate of a P-channel transistor in said second surface area,

(d) introducing P-type impurity into the second surface area to produce source and drain regions of the P-channel transistor while masking the first surface area,

(e) and introducing N-type impurity into the first surface

area to produce source and drain regions of the N-channel transistor while making said second surface area, both the gate of the N-channel transistor and the gate of the P-channel transistor being doped with N-type impurity upon the step of introducing N-type impurity into the first surface area.

4,295,898

METHOD OF MAKING ISOLATED SEMICONDUCTOR DEVICES UTILIZING ION-IMPLANTATION OF ALUMINUM AND HEAT TREATING

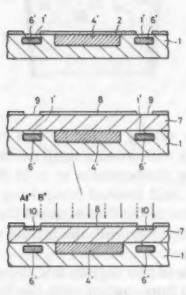
Masakatsu Yoshida, Ibaraki; Yoshihiko Tochio, Kyoto, and Atsutomo Tohi, Hirakata, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed May 8, 1980, Ser. No. 147,715

Claims priority, application Japan, May 15, 1979, 54-60131

Int. Cl.³ H01L *21/265, 21/20*

U.S. Cl. 148—1.5 **3 Claims**



1. Method of making semiconductor device comprising the steps of

ion-implanting Al-ions in a predetermined part of the surface of a p-type silicon substrate,

heat treating said substrate to diffuse said Al-ions thereby forming p^+-type buried region in said substrate,

epitaxially growing an n-type epitaxial layer having a predetermined thickness on said p-type silicon substrate,

ion-implanting Al-ions on the part of the surface of said n-type epitaxial layer over said p^+-type buried region thereby to form p^+-type surface ion-implanted region,

heat treating said substrate and the n-type epitaxial layer thereby to make diffusions of Al-ions from said buried region and said surface ion-implanted region into said n-type epitaxial layer, thereby forming a p^+-type isolation region continuously across said n-type epitaxial layer.

4,295,899

PROCESS FOR COATING IRON AND STEEL

Dieter Oppen, Rodgau, Fed. Rep. of Germany, assignor to Hooker Chemicals & Plastics Corp., Madison Heights, Mich.

Filed Feb. 19, 1980, Ser. No. 122,403

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907093

Int. Cl.³ C23F *7/10*

U.S. Cl. 148—6.16 **5 Claims**

1. A process for producing non-metallic electrical resistance coatings on the surface of iron or steel, comprising contacting a composition free of organic components and comprising an alkali silicate water-glass, an alkali polyphosphate and insoluble Cr_2O_3 pigment wherein the molar ratio of Cr_2O_3:P_2O_5 (equivalent):SiO_2 is 0.005 to 1.5:0.005 to 0.1:1 with the surface at a viscosity of between 400 and 1000 mPa.S, (as measured at 20° C.), and baking the thus treated surface at a temperature of between 150° and 500° C.

4,295,900

ROLLED WIRE HAVING A FINE-GRAIN STRUCTURE

Nils-Gunnar Malmgren; Barry Solly, both of Fagersta, and Stig Tärnblom, Söderbärke, all of Sweden, assignors to Fagersta AB, Sweden

Filed May 26, 1978, Ser. No. 909,959

Claims priority, application Sweden, Jun. 14, 1977, 7706881

Int. Cl.³ C21D *9/52*

U.S. Cl. 148—12 B **2 Claims**

1. A hot rolled wire rod of fine-grain structure consisting of stainless steel and intended for the manufacture of drawn spring wire and rope wire of high mechanical strength and high ductility, characterized in that said wire rod contains 0.04–0.07% C, 18–19% Cr and 8–9.5% Ni wherein a Cr-content of 18% corresponds to a Ni-content of 8.0–8.8% when the C-content is 0.04% and to a Ni-content of 8.8–9.5% when the C-content is 0.07%, and a Cr-content of 19% corresponds to a Ni-content of below 8.3% when the C-content is 0.04% and to a Ni-content of 8.4–9.2% when the C-content is 0.07%, said wire rod having a uniform grain size along said wire rod, said grain size being 8–13 ASTM.

4,295,901

METHOD OF IMPARTING A FINE GRAIN STRUCTURE TO ALUMINUM ALLOYS HAVING PRECIPITATING CONSTITUENTS

Wayne M. Robertson, and John A. Wert, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 5, 1979, Ser. No. 91,234

Int. Cl.³ C22F *1/04*

U.S. Cl. 148—12.7 A **5 Claims**

1. An improvement in a method of imparting a fine grain structure to an aluminum alloy having a precipitating constituent, said method having steps of:

providing an aluminum alloy having a precipitating constituent;

dissolving at least some of said precipitating constituent in said alloy by heating said alloy to a solid solution temperature;

cooling said alloy to a temperature below said solid solution temperature;

overaging said alloy at an overaging temperature to form precipitates;

plastically straining said alloy; and

recrystallizing said alloy by heating it above the minimum recrystallization temperature, whereby said precipitates form nuclei for the recrystallization and controlled growth of a fine grain structure;

said improvement being characterized in that said step of plastically straining said alloy comprises:

heating said alloy to a temperature in the range above said overaging temperature and below said alloy's solvus temperature and reducing its cross-sectional area a total of 40% minimum at a sufficiently high rate to introduce strain energy into said alloy so that complete recovery of said alloy does not occur.

4,295,902

METHOD OF MANUFACTURING ROLLED STEEL PRODUCTS WITH HIGH ELASTIC LIMIT

Marios Economopoulos, Liege, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Feb. 26, 1980, Ser. No. 124,794

Claims priority, application Belgium, Feb. 28, 1979, 874535

Int. Cl.³ C21D *1/18;* C22C *38/46*

U.S. Cl. 148—144 **4 Claims**

1. A method of manufacturing a rolled steel product having an elastic limit in the range from about 500 to about 1200 MPa, the method comprising subjecting a rolled steel product to intense cooling from above its austenitization temperature in

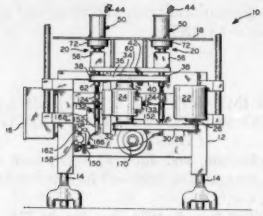
such a way that at least part of the surface of the product is subjected to martensitic and/or bainitic quenching while the remainder of the product stays at a temperature sufficient to allow tempering of the quenched surface to occur subsequently by conduction of heat from the said remainder to the quenched surface, the rolled steel product containing 0.10 to 0.50% C, 0.90 to 1.50% Mn, 0.10 to 0.45% Si, 0.20 to 0.70% Ni, 0.10 to 0.80% Cr, and 0.02 to 0.10% V.

4,295,903

CONTAINER SPINNING APPARATUS FOR CONTAINER MANUFACTURING MACHINE OR THE LIKE

Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 17, 1979, Ser. No. 39,929
Int. Cl.³ B65B *7/28;* B05B *13/02*
U.S. Cl. 156—69 **19 Claims**



1. Apparatus for clamping and rotating containers comprising:

a support;

table means rotatably positioned on said support for supporting a container for rotation about an axis of rotation intersecting said container;

means on said support for mounting said table means on said support whereby said table means is free to rotate about said axis of rotation;

drive means operatively connected to said table means for rotating said table means about said axis of rotation;

a plurality of jaw means each movably mounted on said table means for moving between a first position wherein said jaw means are retracted out of engagement with a container, and a second position wherein said jaw means are actuated into engagement with a container;

jaw-positioning means engageable with said plurality of jaw means and adapted for reciprocal movement coaxial with said axis of rotation of said table means for positioning said plurality of jaw means in the first positions thereof in a first position of said jaw-positioning means and, alternatively, for positioning said plurality of jaw means in the second positions thereof in a second position of said jaw-positioning means; and

actuator means operatively related to said jaw-positioning means for actuating said jaw-positioning mens into said first position thereof and, alternately, actuating said jaw-positioning means into said second position thereof.

12. A method of applying sealant to the inside of a container at the juncture between the inner surfaces of the bottom closure member and the side wall thereof, comprising:

(a) positioning the container on a table adapted for rotation about an axis of rotation intersecting said container;

(b) mechanically clamping the container on said table so that the container rotates with said table;

(c) rotating said table and the container clamped thereto about the axis of rotation;

(d) dispensing a stream of sealant on the juncture between the inner surfaces of the bottom closure member and the side wall of the container during rotation thereof so as to apply a continuous coating of sealant along the full length of said juncture;

(e) stopping the rotation of said table and the container after dispensing the stream of sealant; and

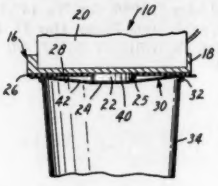
(f) releasing the container from thus stopped table.

4,295,904

METHOD OF HEAT SEALING A FILM TO THE LIP OF A CUP

Paul F. Schmit, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 917,586, Jun. 21, 1978, Pat. No. 4,216,050. This application Apr. 28, 1980, Ser. No. 144,613
Int. Cl.³ B29C *27/02;* B65B *7/28*
U.S. Cl. 156—69 **2 Claims**



1. A method for sealing to the lip of a cup a piece of heat sealable film which will shrink a small amount when heated to normal heat sealing temperatures so as to draw attention to a feature in the film, said method comprising the steps of:

positioning a piece of the film adjacent the lip of the cup and over the cup opening with the feature surrounded by the lip of the cup;

pushing the piece of film slightly into the opening of the cup;

pressing the film into contact with the lip of the cup while heating the film to a first temperature adapted to fuse it to the lip; and

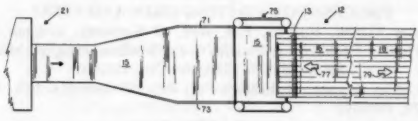
heating a first portion of the film around the feature to a second temperature which exceeds said first temperature to shrink said first portion of the film and gather a portion of the piece of film surrounding said first portion into outwardly radially extending ridges and grooves.

4,295,905

FILL STRAND TRANSFER PROCESS FOR MAKING NON WOVEN FABRICS

Hollis H. Bascom, Livermore; Stephen Matweyou, Oakland; Alan J. Andersen, Livermore, and John J. Greci, Livermore, all of Calif., assignors to Orcon Corporation, Union City, Calif.

Filed Dec. 14, 1979, Ser. No. 103,621
Int. Cl.³ B65N *81/00*
U.S. Cl. 156—174 **14 Claims**



1. A method of transferring fill strands to form a non woven fabric and comprising,

guiding warp strands into the nip of a set of pressure rolls,

supporting a preformed, planar set of adhesive coated or impregnated fill strands in a fixed orientation, a fixed spacing, and a fixed tension of the fill strands near the pressure rolls so that said set of fill strands can be subsequently transferred as a set with said fixed orientation, spacing and tension to said warp strands in the nip of the pressure rolls,

feeding said preformed, planar set of fill strands having said fixed orientation, spacing and tension into the nip of the pressure rolls with the warp strands, and

transferring the fill strands with said fixed orientation, spacing and tension to the warp strands to form the fabric by causing the adhesive on the fill strands to adhere to the warp strands under the effect of the pressure produced in the nip of the pressure rolls.

4,295,906

METHOD FOR PRODUCING A MOTION PICTURE SCREEN

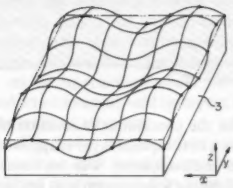
Wataru Shimada; Susumu Hoshinouchi; Kenji Kawaguchi, and Akio Yoshida, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,744

Claims priority, application Japan, Mar. 27, 1979, 54-36631

Int. Cl.³ G03B *21/56, 21/60*

U.S. Cl. 156—214 **6 Claims**



1. A method for producing a motion picture screen comprising the steps of preparing a two-dimensional cutter the cutting edge of which comprises a number of circular arcs, connected together in a smooth wavy line, in the X-Z plane in a space coordinate system, each of said arcs having a predetermined curvature and a predetermined center angle, and the centers of the neighbouring ones of said circular arcs being located on opposite sides of said line, placing a workpiece from which said motion picture screen is to be produced and said two-dimensional cutter in the X-Z and X-Y planes, respectively, and machining the surface of said workpiece by said two-dimensional cutter while moving said workpiece and said cutter for producing a relative motion therebetween for forming a machined surface which comprises smooth connected wavy curves in sections parallel with both the X-Z and Y-Z planes, said curves respectively comprising a number of circular arcs, each of said last mentioned circular arcs having a predetermined curvature and a predetermined center angle, and the centers of the neighbouring ones of said circular arcs being positioned on opposite sides of said curves.

4,295,907

METHOD OF MAKING GLASS FIBER REINFORCED LAMINATE

Howard P. Cordts, Grafton, and Joan E. Karloske, Saukville, both of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Dec. 28, 1979, Ser. No. 107,834

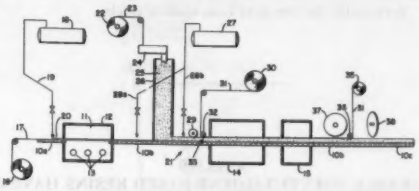
Int. Cl.³ B29C *19/00*

U.S. Cl. 156—246 **5 Claims**

1. In the method for manufacturing glass fiber reinforced plastic laminate which comprises applying glass fibers and unpolymerized unsaturated polyester resin syrup between two carrier films and thereafter heating the resulting sandwich until the said unsaturated polyester resin syrup is cured and thereafter removing the carrier films and recovering as a product a sheetlike mass of glass fibers which are embedded within the cured unsaturated polyester resin syrup, the improvement comprising:

applying to a first of said carrier films a resin layer of UV curable resinous composition containing an ultraviolet radiation sensitizer,

exposing the said resin layer and the said first carrier film to ultraviolet radiation until the said resin layer is at least partially polymerized,



thereafter applying the said glass fibers and unsaturated polyester resin syrup to the said resin layer and thereafter applying the second of said carrier films to complete the sandwich; and subsequently heating the sandwich to cure the said unsaturated polyester resin syrup and to polymerize any unpolymerized components of the said resin layer.

4,295,908

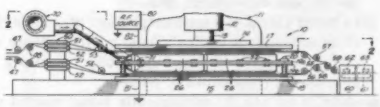
METHOD AND APPARATUS FOR HEAT SEALING A PLURALITY OF SETS OF CONTINUOUS PLASTIC STRIPS TOGETHER BY RADIO FREQUENCY ENERGY

Hans G. Schaefer, Lakewood, and Alfred Langer, Westminster, both of Calif., assignors to Manhattan R. F. Die Company, South Gate, Calif.

Filed Dec. 10, 1979, Ser. No. 102,130

Int. Cl.³ B29C *27/04;* B32B *31/18, 31/20*

U.S. Cl. 156—251 **27 Claims**



1. Radio frequency powered apparatus for heat sealing a plurality of sets of plastic sheets together to form simultaneously a plurality of separate items comprising:

at least three superimposed platens including an upper platen, a lower platen and an intermediate platen normally resiliently supported between and spaced from said upper and lower platens and including means electrically isolating said platens from one another;

heat sealing die means on the opposed faces of said intermediate platen shaped to cooperate with the juxtaposed face of the adjacent one of said upper and lower platens to heat seal the sheets of each set of plastic sheets together in areas thereof held in pressurized contact with one another;

a source of radio frequency energy having the output thereof connected to energize said platens when the same are held pressed against respective sets of plastic sheets on the remote sides of said sealing die means; and

means supporting said platens for reciprocation toward one another to compress the sheets of said sets of sheets together in areas in contact with said die means while said platens are energized with radio frequency energy to heat seal the sheets of each of said sets of sheets together.

22. That method of simultaneously heat sealing two sets of a plurality of superimposed plastic strips together in predetermined selected areas thereof in successive heat sealing cycles which comprises:

advancing separate sets of superimposed plastic strips past the opposite faces of a platen having heat sealing and tear forming dies fixed to and protruding from a respective face thereof and which platen is floatingly positioned directly between and electrically isolated from the upper

and lower platens of a radio frequency powered heat sealing press; and

closing said upper and lower platens toward one another while energizing the same with radio frequency power thereby to heat seal said sets of strips together in predetermined selected areas before indexing said sets of strips forwardly for the next heat sealing cycle.

4,295,909

CURABLE POLYBUTADIENE-BASED RESINS HAVING IMPROVED PROPERTIES

Louis J. Baccei, Farmington, Conn., assignor to Loctite Corporation, Newington, Conn.

Continuation of Ser. No. 64,170, Aug. 6, 1979, abandoned, which is a continuation of Ser. No. 813,207, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 546,250, Feb. 3, 1975, abandoned. This application Oct. 10, 1980, Ser. No. 195,986

Int. Cl.³ C09J *5/02;* **C08F** *8/30;* **C08L** *75/04*

U.S. Cl. 156—307.3 **27 Claims**

1. An adhesive and sealant composition having improved thermal and impact properties and curable through gaps of more than 40 mils, comprising:

I. a polymerizable product corresponding in structure to a reaction product of:

(a) a polybutadiene polyol of polyamine comprising about 5 to about 150 butadiene units and having at least about 70 percent of the butadiene units in the 1,4-configuration and selected from the group consisting of polybutadiene, butadiene-acrylonitrile copolymers, and butadiene-styrene copolymers, and,

(b) a molar excess of a reaction product of: a molar excess of an aromatic or cycloaliphatic polyisocyanate with a compound selected from the group consisting of an aromatic or cycloaliphatic polyol,

the product of (a) and (b) subsequently being reacted with a molar excess of a hydroxyalkyl acrylate, a hydroxyalkyl methacrylate, an aminoalkyl acrylate, or an aminoalkyl methacrylate; and

II. a free radical initiator.

4,295,910

PROCESS FOR PRODUCTION OF VINYL FILM-CELLULOSIC LAMINATES AND LAMINATES PRODUCED THEREBY

James Cooley, and Ozzie Fogle, both of Orangeburg, S.C., assignors to Champion International Corporation, Stamford, Conn.

Filed Apr. 25, 1980, Ser. No. 143,625

Int. Cl.³ C09J *5/04*

U.S. Cl. 156—314 **9 Claims**

1. A process for bonding a polymeric film to a cellulosic substrate which comprises:

(A) coating said substrate with an organic polyisocyanate having at least two active isocyanate groups per molecule;

(B) coating vinyl acetate-ethylene copolymer emulsion adhesive onto said polyisocyanate to form an interlaminate adhesive layer; and

(C) applying a vinyl polymeric film to said interlaminate adhesive layer; whereby a permanently bonded laminate is formed.

4,295,911

PROTECTIVE LAYER FOR SURFACE SEALS IN BUILDING CONSTRUCTION, UNDERGROUND CONSTRUCTION, AND CIVIL ENGINEERING CONSTRUCTION

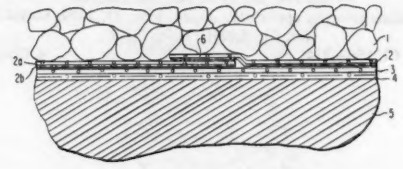
Karl Haage, Troisdorf-Spich, and Dieter Scharff, Troisdorf-Sieglar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 818,232, Jul. 22, 1977, Pat. No. 4,239,795, which is a continuation of Ser. No. 596,765, Jul. 17, 1975, abandoned. This application May 30, 1980, Ser. No. 155,000

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1974, 2434328

Int. Cl.³ C09J *5/04, 5/02*

U.S. Cl. 156—315 **2 Claims**



1. A process for the continuous production of a protective covering, wherein a first topcoat layer is applied as a soft PVC plastisol onto an endless carrier web at room temperature; gelling is initiated during a short-term heat application of about 160°–200° C.; whereupon a second topcoat layer is applied to the first topcoat layer and a lattice-like fabric is placed on said second topcoat layer, which is still in the un-gelled condition; then gelling is initiated in the first and second topcoat layers by heating in a temperature range of between 160° C. and 250° C., while simultaneously the bonding to the lattice-like fabric is taking place, said lattice-like fabric being a resilient fabric having fibers joined together at junctions that yield under the effect of a load, and said topcoat layers having differing composition, the first topcoat layer having a higher weatherability due to the addition of stabilizers and a lower filler content as compared to the second topcoat layer.

4,295,912

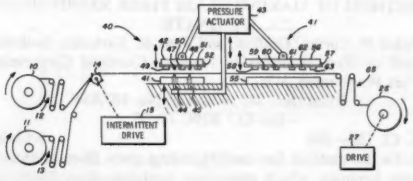
APPARATUS AND PROCESS FOR LAMINATING COMPOSITE TAPE

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 921,644, Jul. 3, 1978, abandoned. This application Jul. 17, 1979, Ser. No. 58,404

Int. Cl.³ B32B *31/08, 31/20;* **B65H** *17/40*

U.S. Cl. 156—324 **17 Claims**



1. The process for precision laminating at least a pair of strips having substantially dissimilar mechanical properties and at least one of which has a surface coating of unactivated but activatable adhesive, said strips further having mating edge located perforations, said process comprising:

advancing said strips together in intermittent fashion, said intermittent advancing operating to advance said strips a

predetermined distance in a cyclic manner having a predetermined rest interval;
aligning said strips to obtain registry therebetween;
pressing a first bonding tool against said strips during said rest interval, said first bonding tool being contoured to contact a limited area of said strips;
heating said strips to at least partly activate said adhesive during said rest interval and while said strips are in registry to create a tack bond between said strips;
pressing a second bonding tool against said strips to heat and activate said adhesive during said rest interval, said second bonding tool being contoured to contact said strips over an area having a length of at least said predetermined distance; and
heating said strips to a second temperature to activate said adhesive over the area of said second bonding tool whereby said strips are fully laminated together.

9. Apparatus for precision laminating at least a pair of strips having substantially dissimilar mechanical properties and at least one of which has a surface coating of unactivated but activatable adhesive, said strips further having mating edge located perforations, said apparatus comprising:
means for advancing said strips simultaneously through said apparatus on an intermittent cycle having a transport interval and a rest interval, said transport interval producing a predetermined advance;
means for locating said strips to register said perforations;
means for pressing a first bonding tool against said strips during said rest interval said first bonding tool having a surface that contacts said strips over a limited area portion;
means for heating said strips to a first temperature to at least partly activate said adhesive and tack said strips together over a limited area;
means for pressing a second bonding tool against said strips, said second bonding tool having an area including the width of said strips and a length at least equal to said predetermined advance; and
means for heating said strips to a second temperature to activate said adhesive and to laminate said strips substantially over their entire area.

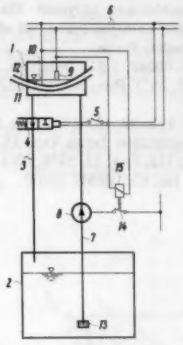
4,295,913

ELECTRICALLY OPERATED DEVICE, ESPECIALLY DUPLICATING DEVICE, WITH A RECEPTACLE TO ACCOMMODATE FLUID FOR THE CHEMICAL TREATMENT OF OBJECTS

Horst Purr, Tennenbronn; Manfred Kistler, Eisenbach, and Rolf Müller, St. Georgen, all of Fed. Rep. of Germany, assignors to Mathias Bauerle GmbH, Georgen, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,666
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908283
Int. Cl.³ B41C *1/10*
U.S. Cl. 156—345 **15 Claims**

1. An electrically operated offset printer including means for etching offset printing films, said means for etching comprising a dip tank having means for passing said offset printing films therethrough, a storage tank for storing the etching fluid, a supply conduit connecting said dip tank and said storage tank for passing etching fluid from said storage tank to said dip tank, pump means for causing etching fluid to pass from said storage tank to said dip tank, an automatic charging and metering unit for controlling said pump means to pump etching fluid into said dip tank when the fluid level in the dip tank is below a predetermined level, and a drain conduit, connecting the storage tank with the dip tank, for draining the etching fluid from the dip tank, said drain conduit including a solenoid valve which is adapted to be opened for draining the etching fluid from the dip tank, whereby the dip tank can be drained when the printer is turned off and the dip tank will be filled to operating level when the printer is operated, without continuous operation of said pump means.

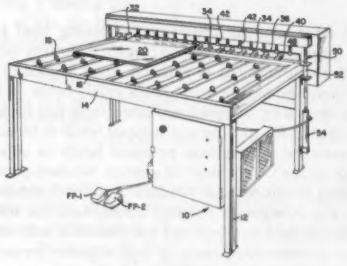


4,295,914

APPARATUS FOR APPLYING SEALANT MATERIAL TO A WORKPIECE

John C. Checko, 5 Northern Dr., Bridgewater, N.J. 08807

Filed Aug. 22, 1979, Ser. No. 68,691
Int. Cl.³ B32B *31/04, 31/14*
U.S. Cl. 156—357 **13 Claims**



1. Apparatus for applying sealant material to a workpiece assembly, wherein said workpiece assembly includes two planar members separated by at least one spacer, comprising:
a work supporting surface for receiving said workpiece assembly;
means for aligning said planar members and said spacer of said workpiece assembly relative to each other and in a fixed position relative to a sealant applying means;
said aligning means including stop members for engaging an exposed edge of said workpiece assembly;
means for moving said stop members out of engagement with said exposed edge of said workpiece assembly;
means for clamping said workpiece assembly in said fixed position on said supporting surface with at least one edge exposed for receiving sealant material;
means for applying sealant material being mounted to face the exposed edge of said workpiece assembly and operable to apply sealant material when said stop members are moved out of engagement with the exposed edge of said workpiece assembly; and
means for moving said sealant applying means relative to said workpiece assembly to apply sealant material along the edge of said workpiece assembly.

4,295,915
LABEL HANDLING APPARATUS

Tadahiro Sakaguchi, Nishinomiya; Masamichi Hino, Suita; Setsuo Tsuji, Hashimoto; Akiyoshi Hashido, Yao, and Kazuyoshi Enomoto, Kawachinagano, all of Japan, assignors to Kubota Ltd., Osaka, Japan

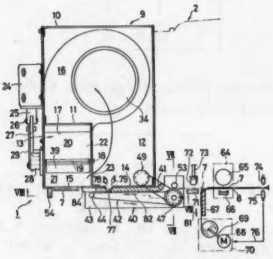
PCT No. PCT/JP79/00042, § 371 Date Sep. 24, 1979, § 102(e) Date Sep. 24, 1979, PCT Pub. No. WO80/00827, PCT Pub. Date May 1, 1980

PCT Filed Feb. 22, 1979, Ser. No. 103,948

Claims priority, application Japan, Oct. 13, 1978, 53-126332; Oct. 13, 1978, 53-126333; Oct. 13, 1978, 53-126335

Int. Cl.[3] B65H *25/00*

U.S. Cl. 156—361 51 Claims



1. A label handling apparatus comprising label preparing means for preparing labels each being temporarily retained on a backing strip through an adhesive agent applied to one surface thereof and having desired data visibly borne on the other surface thereof by stripping said labels from said backing strip in preparation for sticking said stripped labels to objects, sticking means for sticking said prepared labels to objects, said sticking means comprising air current producing means for producing air currents to produce a positive pressure atmosphere and a negative pressure atmosphere, an atmosphere chamber adapted to selectively communicate with either said positive pressure atmosphere or said negative pressure atmosphere produced by said air current producing means, said atmosphere chamber formed with a portion communicating with the ambient air, said ambient air communicating portion being provided with a label retaining port for blowing off and projecting labels and for sucking and retaining labels, gate means for selecting said negative pressure atmosphere or said positive pressure atmosphere, said gate means comprising two gate members, said two gate members comprising opposed end edge portions, said gate members operable in a symmetrical manner so that opposed end edges are brought close to each other in a path closing state and so that said end edges are moved away from each other in a path opening state, gate means driving apparatus for driving and controlling said gate means whereby labels are blown off and projected or sucked and retained at the label retaining port depending upon the position of said gate members, transfer means for transferring said labels from said label preparing means to said sticking means, said transfer means including a moving portion which contacts only a portion of the surface of said label having said adhesive agent applied thereto so as to contact withdraw and transfer said label, and controlling means for controlling the relative timing between the label preparing operation in said label preparing means and the label sticking operation in said sticking means.

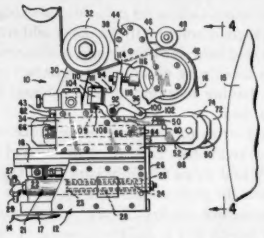
4,295,916
TAPE BRAKE FOR TAPE WRAPPER

Samuel B. Stevens, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 11, 1979, Ser. No. 133,634

Int. Cl.[3] B29H *17/00*

U.S. Cl. 156—397 11 Claims



1. In an apparatus (**10**) for severing a tape (**16**) being applied to a body (**15**) as said body (**15**) is moved past said apparatus (**10**), a housing (**20**), an applicator roller (**42**) carried by said housing (**20**) for applying tape (**16**) to said body (**15**), a holder (**50**) movably carried on said housing (**20**), a stitching roller (**72**) rotatably mounted on said holder (**50**) and projecting outward from said housing (**20**) to a predetermined position relative to said applicator roller (**42**), resilient means (**66**) urging said holder (**50**) and said stitching roller (**72**) outward from said housing (**20**) to position said stitching roller (**72**) outboard of said applicator roller (**42**), in combination: brake means (**94**) carried by said housing (**20**) for arresting rotation of said applicator roller (**42**), and means (**80**) on said holder (**50**) for activating said brake means (**94**) in response to said holder (**50**) and stitching roller (**72**) being extended a predetermined amount outboard of said applicator roller (**42**) whereby the tape (**16**) extending from said applicator roller (**42**) to said stitching roller (**72**) is severed as said body (**15**) is moved past said stitching roller (**72**).

4,295,917
WINDING OF FIBRES

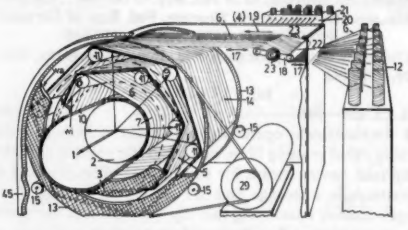
Wolf W. Stinnes, 31 Johann Rissik Dr., Waterkloof Ridge, Pretoria, South Africa

Filed Dec. 29, 1978, Ser. No. 974,422

Claims priority, application South Africa, Dec. 29, 1977, 77/7700

Int. Cl.[3] B65H *8/00*

U.S. Cl. 156—428 8 Claims



1. A machine for continuously winding endless fibres onto an object, the machine having an open ended hollow rotating fibre carrier and guide around the object, the carrier being adapted for the accumulation of turns of fibre on its outside, the guide being adapted to lead the fibre from underneath layers of the turns accumulated on the outside of the hollow carrier inwardly to the object and means adapted to rotate the

carrier with the guide wherein the outside of the carrier comprises fibre support means adapted for the easy rotation of the accumulated turns of fibre relative to the carrier, and further comprising a stationary fibre bank for supplying the carrier with fibre, means adapted to reverse the direction of rotation of the carrier and buffer means intermediate between the carrier and the fibre bank adapted to take up turns from the carrier during reverse rotation,

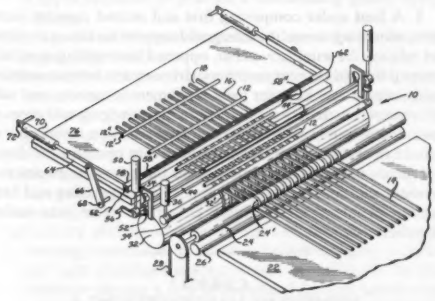
the buffer means comprising an outer hollow open-ended rotating carrier and guide, the fibres proceeding from the bank to the outer hollow carrier, being accumulated in several turns on this outer carrier, then proceeding from underneath layers of the turns of the outer carrier inwardly over a guide thereof to an inner hollow carrier, and means adapted to rotate the outer carrier with guide at rotational speeds bearing a constant ratio to rotational speeds at which the inner carrier is rotated both in forward and reverse direction.

4,295,918

APPARATUS FOR ASSEMBLING A PLASTIC MINING SCREEN

Henry E. Benson, Long Lake, and Terrence D. Moravec, Minneapolis, both of Minn., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 26, 1979, Ser. No. 107,488
Int. Cl.³ B07B *1/46*; B32B *1/00*
U.S. Cl. 156—434 **9 Claims**



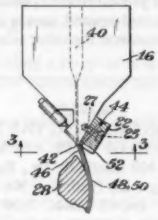
1. An assembly apparatus for assembling and thermally welding an elongated support rod having at least a thermoplastic coating simultaneously to a plurality of spaced, profiled screen surface members having at least a thermoplastic coating and which are arranged in a plane so as to be parallel to each other and transverse to said support rod; said apparatus having a pair of cooperating feed rollers, at least one of which is driven, for engaging and feeding said profiled members to a welding station wherein they are supported by a support roller; at least one of said feed rollers being grooved to accept said profiled members and to establish their spacing relative to each other; an elongated support rod positioning bar having at least one surface which includes a groove for receiving a support rod and retaining it, said support rod positioning bar being located above the welding station and said at least one surface comprising its bottom surface during a welding operation; an elongated welding bar mounted for movement into and out of a position in a vertical plane in the welding zone area between said support rod positioning bar and said profiled members, said welding bar containing heater means and having upper and lower heated portions for simultaneously heating the bottom side of said support rod carried by said support rod positioning bar and a top portion of each of said profiled members; and means for forcing said support rod positioning bar and the support rod positioned thereunder downwardly as the welding bar is removed from said welding zone area, said downward movement causing the intersecting portions of said support rod and profiled members which are at least partially melted or softened by the welding bar to flow together into an intimate fused relationship.

4,295,919

FORMING AN INTEGRAL CLOSURE FOR A THERMOPLASTIC CONTAINER

Thomas A. Sutrina, Rockford, Ill., and R. Douglas Behr, Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 969,911, Dec. 15, 1978. This application May 14, 1980, Ser. No. 149,861
Int. Cl.³ B29D *7/04*
U.S. Cl. 156—498 **8 Claims**



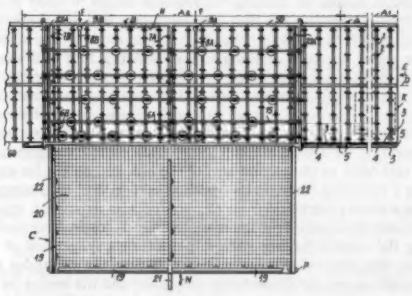
1. An apparatus for forming an integral thermoplastic fastening means on a cast film or sheet, said apparatus comprising an extrusion die having an extrusion channel ending in extrusion die lips, said die lips presenting a surface defining a plane, a side of said die presenting a face angularly disposed towards said extrusion channel and die lips, an extrusion die block located adjacent said face, a die plate secured to the die block, said die plate having a leading edge, said leading edge located out of the plane of the die lips, said die block having an extrusion channel disposed angularly adjacent the exit of said die block so as to increase the acuteness of the angularity of the extrudate issuing from the die plate with respect to the extrudate issuing from said die lips, and cooling means located below said extrusion die and die plate.

4,295,920

APPARATUS FOR AUTOMATICALLY PRODUCING GLAZED INSULATING WINDOW OR DOOR PANELS

Luigi Bovone, 15070 Belforte Monferrato, Alessandria, Italy

Filed Nov. 26, 1979, Ser. No. 97,789
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—557 **10 Claims**



1. An apparatus for automatically manufacturing glazed insulating window or door panels constituted by two glass panes spaced apart by a frame interposed therebetween, comprising:

first means for situating a first pane in a predetermined position;

second means located in operative relationship to said first means for raising the first pane from a predetermined position to an elevated position;

mobile plate means located in operative relationship to said first means for situating a frame provided with at least a partial coating of adhesive in a certain position below the first pane when the latter is in its elevated position;

said second means further comprising means for lowering the first pane from the elevated position when the frame is situated in a certain position until the first pane contacts one side of the frame to form an assembly therewith and for thereupon raising the assembly;

said first means further comprising means for situating the second pane in a predetermined position below said assembly whereupon said second means lowers said assembly until the frame contacts the other side of the frame to form a panel.

4,295,921

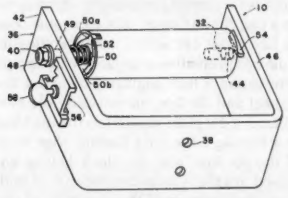
SYSTEM FOR CONTROLLING THE MOVEMENT AND LOCKING OF TAPE APPARATUS

John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228

Filed Apr. 16, 1980, Ser. No. 140,858

Int. Cl.³ B44C *7/00*

U.S. Cl. 156—577 **1 Claim**



1. In a tape reel system having a spool for unreeling tape therefrom and means for mounting the spool rotatably, the improvement comprising: the means for mounting including means for adjustably retarding rotation of the spool; means for locking the spool for preventing said rotation of the spool; the means for mounting including a spindle with first and second ends, the spool being cylindrical and having aperture-defining means in the circumference of a first end thereof, the spindle having spool-aperture engaging means adjacent the second end thereof for connecting the spool for rotation therewith; the mounting means further including a bracket comprising a base and first and second arms integral with the base, the means for adjustably retarding rotation including resilient means on the spindle; means for causing the resilient means to exert adjustable force against the first arm including said spool-aperture engaging means having threaded connection with the spindle; the spool aperture defining means defining first and second slots diametrically opposed in said first end of the spool, the aperture engaging means detachably engaging both said slots; the spool having a second end with an end cover thereover having a hole in the center thereof, said means for rotatably mounting the spool, mounting said end cover, by engagement at said hole, to the second arm of the bracket; means for exerting a retarding force on the spool at said second end, comprising a fixed protrusion from the second arm extending against the end cover adjacent the hole; the means for locking including the spindle having a shape permitting engagement of the first end thereof, means on the first arm for engaging said spindle shape, the shape being polygonal and the means on the first arm having an open-end wrench shape proportioned for fitting to said polygonal shape; the means on the first arm having a sliding engagement with the first arm and means for adjustably fixing the sliding position of said sliding engagement; the sliding engagement being on the outside of the first arm and the resilient means comprising a compression spring held on said spindle in a space between said first arm and said spool aperture engaging means; the spindle second end having a closure with a hole therein, means protruding from the second arm into the hole, and means permitting ready removal and reloading of a spool comprising the compression spring having sufficient length to permit a spool to be thrust thereagainst and compress the spring to an extent clearing the second end of the spool from said means protruding.

4,295,922

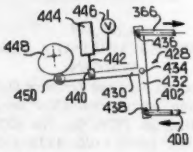
TUBE SIDE SEAM HEAT SEALER

Jack R. Evers, Torrance, Calif., assignor to Developak Corporation, Redondo Beach, Calif.

Filed Sep. 17, 1979, Ser. No. 76,449

Int. Cl.³ B30B *5/02*

U.S. Cl. 156—583.1 **14 Claims**



1. A heat sealer comprising first and second support members, mounting means mounting said support members in parallel relation for axial movement, opposed heat sealing members carried by said support members, drive means interconnecting said support members for axial movement in unison; and said drive means including fluid pressure means urging said support members to positions wherein said heat sealing members are in closed operative positions, and selectively operable mechanical means operable to overcome said fluid pressure means and to move said support members to positions separating said heat sealing members for receiving an article to be heat sealed therebetween.

4,295,923

METHOD OF MANUFACTURING A SEMICONDUCTOR/GLASS COMPOSITE MATERIAL

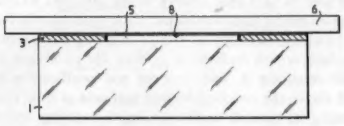
Erich Kasper, Senden, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 130,122

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909985

Int. Cl.³ H01L *21/306*

U.S. Cl. 156—630 **5 Claims**



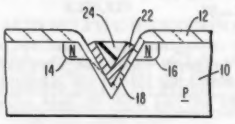
1. A method of manufacturing a semiconductor/glass composite material, in which at least one semiconductor layer is permanently connected to a plate-shaped glass substrate comprising the steps of covering the glass substrate at least partially by a second layer on its surface facing the semiconductor; bringing the semiconductor and the glass substrate into contact in the surface areas not provided with the second layer; connecting them by means of the action of pressure and heat; and etching away the semi-conductor layer to the thickness of the second layer by means of etch polishing.

4,295,924

METHOD FOR PROVIDING SELF-ALIGNED CONDUCTOR IN A V-GROOVE DEVICE

Richard R. Garnache, South Burlington, and Donald M. Kenney, Shelburne, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1979, Ser. No. 103,981
Int. Cl.³ H01L *21/308*
U.S. Cl. 156—643 **10 Claims**



1. The method of providing a conductive electrode for a semiconductor device comprising the steps of:

providing a semiconductor substrate having a surface containing at least one recessed groove to which an electrode is to be provided;

depositing a substantially uniform layer of electrode forming material over at least a portion of said surface including all of said groove;

dispensing a layer of mask-forming organic material over said layer of electrode forming material and said surface to a depth sufficient to provide a substantially planar upper surface;

heating said substrate to harden said layer of mask-forming organic material;

selectively etching said layer of organic material in preference to said electrode forming material to a depth below the level of the surface of said substrate to expose the portion of said layer of electrode forming material outside of the area of said groove;

applying a blocking mask over at least a part of said exposed layer of electrode forming material adjacent to, and extending over one end of the area of said groove;

selectively etching and removing said layer of electrode forming material in preference to said masking material and said blocking mask to provide an electrode on said substrate having a first etch-defined portion terminating within said groove below said surface of said substrate and a second connected portion remaining on said surface; and

removing both said masking material and said blocking mask.

9. The method of claim **1** wherein the step of providing said substrate further comprises the steps of:

providing a silicon semiconductor substrate of a predetermined conductivity type;

forming a first dielectric layer on said first surface of said silicon semiconductor substrate;

providing at least one opening in said dielectric layer to expose a region of said first surface; and

anisotropically etching said exposed region to form said groove therein.

4,295,925

TREATING PULP WITH OXYGEN

Jozef M. Bentvelzen, Sumner; Michael D. Meredith, Federal Way, both of Wash.; Henry Bepple, Kamloops, Canada; Louis O. Torregrossa, Puyallup, Wash.; Howard R. Battan, Auburn, Wash., and Dennis H. Justice, Everett, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 15, 1979, Ser. No. 48,935
Int. Cl.³ D21C *9/04, 9/10*; D21D *5/28*
U.S. Cl. 162—19 **40 Claims**

1. A wood pulp process comprising

continuously digesting wood chips with chemicals under heat and pressure to form delignification products and delignified wood chips,

removing at least a part of said delignification products,

forming wood pulp from said delignified wood chips by partially releasing the pressure from said wood chips,

transporting a slurry containing said wood pulp and remaining delignification products under pressure to a storage tank, and

storing said slurry in said tank,

prior to said storage, adjusting the pH of said slurry to a pH in the range of 8 to 14,

between said pH adjustment and said storage, adding oxygen to said slurry,

between said pH adjustment and said storage, mixing said oxygen with said slurry in a mixing zone in which a plurality of rotating members pass through said slurry in a direction transverse the direction of travel of said slurry,

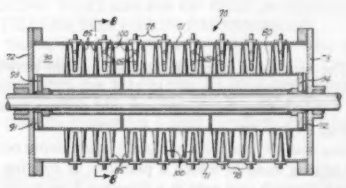
said members having a major axis extending in the direction of rotation,

said members providing a swept area through said slurry of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp,

said members having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm.

23. A pulping apparatus comprising

a continuous digester for continuously digesting wood chips to form delignification products and delignified wood chips, and



a washer associated with said digester for removing at least a part of said delignification products,

said digester having a pressure relief valve for forming wood pulp from said delignified wood chips by partially releasing the pressure from said wood chips,

a pipe for transporting a slurry containing said wood pulp and remaining delignification products under pressure from said digester to a storage tank, and

said storage tank,

means, prior to said storage tank, for adding a pH adjustment chemical to said slurry,

means, between said pH adjustment chemical addition means and said storage tank, for adding oxygen to said slurry, and

means, prior to said storage tank, for mixing said oxygen with said slurry, said mixing means having

a mixing zone,

a plurality of rotors in said mixing zone,

said rotors having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm.

said rotors having a major axis extending in the direction of rotation,

said rotors being rotatable through said slurry in a direction transverse to the direction of travel of said slurry,

means for rotating said rotors, and

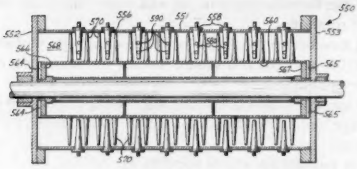
said rotors providing a swept area of from 10,000 to 1,000,000 square meters per metric ton of oven dry pulp.

4,295,926

METHOD AND APPARATUS FOR TREATING PULP WITH OXYGEN

Jozef M. Bentvelzen, Sumner; Michael D. Meredith, Federal Way, both of Wash.; Henry Bepple, Kamloops, Canada; Louis O. Torregrossa, Puyallup, Wash.; Howard R. Battan, Auburn, Wash., and Dennis H. Justice, Everett, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 15, 1979, Ser. No. 49,001
Int. Cl.³ D21C *9/10*; D21D *5/28*
U.S. Cl. 162—57 **88 Claims**



1. The process of creating intimate current between wood pulp having a consistency of 7 to 15% and a pH in the range of 8 to 14 and treating said pulp with said oxygen, comprising

adding oxygen to said pulp,

mixing said oxygen with said pulp, said mixing occurring in a mixing zone in which a plurality of rotating members pass through said pulp in a direction transverse the direction of travel of said pulp,

said members having a major axis extending in the direction of rotation,

said members providing a swept area through said pulp of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp,

said members having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

transporting said pulp to a washer, and

washing said pulp in said washer.

53. A apparatus for creating intimate contact between a pulp having a consistency of 8 to 15% and oxygen and treating said pulp with said oxygen, comprising

means for transporting said pulp to a washing means,

said means for washing said pulp,

before said washing means,

means for adding alkali to said pulp,

means for adding oxygen to said pulp, and

means for mixing said oxygen with said pulp, said mixing means having a mixing zone,

a plurality or rotors on said shaft in said mixing zone,

said rotors having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

said rotors being rotatable through said slurry in a direction transverse in the direction of travel of said slurry,

said rotors having a major axis extending in the direction of rotation,

means for rotating said rotors, and

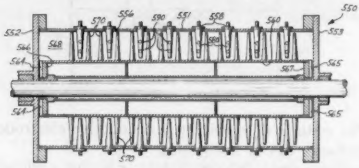
said rotors providing a swept area of from 10,000 to 1,000,000 square meters per metric ton of oven dry pulp.

4,295,927

METHOD AND APPARATUS FOR TREATING PULP WITH OXYGEN AND STORING THE TREATED PULP

Jozef M. Bentvelzen, Sumner; Michael D. Meredith, Federal Way, both of Wash.; Henry Bepple, Kamloops, Canada; Louis O. Torregrossa, Puyallup, Wash.; Howard R. Battan, Auburn, Wash., and Dennis H. Justice, Everett, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 15, 1979, Ser. No. 48,917
Int. Cl.³ D21C *9/10*; D21D *5/28*
U.S. Cl. 162—57 **88 Claims**



1. The process of creating contact between a wood pulp having a consistency of 8 to 15% and a pH in the range of 8 to 14 and oxygen, and treating said pulp with said oxygen, comprising

adding oxygen to said pulp,

intimately mixing said oxygen with said pulp, said mixing occurring in a mixing zone in which a plurality of rotating members pass through said pulp in a direction transverse the direction of travel of said pulp,

said members having a major axis extending in the direction of rotation,

said members providing a swept area through said pulp of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp,

said members having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

transporting said pulp to a storage tank, and

storing said pulp in said storage tank.

53. An apparatus for intimately mixing a pulp having a consistency of 8 to 15% with oxygen, and treating pulp with said oxygen, comprising

means for transporting said pulp to a storage tank, and

a storage tank,

before said storage tank,

means for adding alkali to said pulp,

means for adding oxygen to said pulp, and

means for mixing said oxygen with said pulp, said mixing means having a mixing zone,

a plurality of rotors in said mixing zone,

said rotors having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

said rotors being rotatable through said pulp in a direction transverse to the direction of travel of said pulp,

said rotors having a major axis extending in the direction of rotation,

means for rotating said rotors, and

said rotors providing a swept area of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp.

4,295,928

PHENOLIC COMPOUNDS AS VISCOSITY PRESERVATIVES DURING HYPOCHLORITE PULP BLEACHING

Michael D. Breslin, Downers Grove, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 7, 1980, Ser. No. 176,229
Int. Cl.³ D21C *9/14*
U.S. Cl. 162—73 **5 Claims**

1. In a method for the bleaching of aqueous slurries of chem-

ically produced cellulosic materials utilizing a hypochlorite bleaching agent selected from the group consisting of sodium hypochlorite and calcium hypochlorite, the improvement comprising maintaining in the aqueous slurry of the chemically produced cellulosic material during treatment with said bleaching agent from 0.01–0.5% by weight of an aromatic compound selected from the group consisting of: thymol and hydroquinone.

4,295,929

PROCESS FOR ACID SULFITE DIGESTION OF WOOD

Phyllis C. Leithem, McCleary, Wash., assignor to International Telephone and Telegraph Corp., New York, N.Y.

Continuation-in-part of Ser. No. 54,425, Jul. 3, 1979, abandoned. This application Mar. 19, 1980, Ser. No. 131,813

Int. Cl.³ D21C *3/06*

U.S. Cl. 162—83 **13 Claims**

1. In a process of digesting wood to produce chemical pulp by the acid sulfite digestion process in which the ratio by weight of total SO_2 to combined SO_2 is at least 4 to 1 comprising heating in a closed vessel wood chips in an acid sulfite cooking liquor having a concentration of free SO_2 no greater than 16% to a maximum cooking temperature no greater than 180° C. and at a maximum pressure no greater than 170 psig for a period of time sufficient to defiber the wood,

the improvement in which the ratio by weight of one part of combined SO_2 to 100 parts of dry wood is from 4 to 12 and the minimum average rate of heating to a temperature which is the substantially maximum cooking temperature is 40° C. per hour.

4,295,930

ALKOXYLATED DIOXOLANES AS PAPER SIZING AGENTS

Thomas Aitken, Chicago; David J. Kowalski, Clarendon Hills, and K. G. Srinivasan, Oak Park, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 17, 1980, Ser. No. 130,666

Int. Cl.³ D21H *3/02*

U.S. Cl. 162—158 **41 Claims**

1. A composition for sizing paper comprising the acid catalysed reaction product of an aqueous solution of glyoxal containing no less than 40 wt % and no more than 80 wt % glyoxal, and a hydrophobe chosen from the group consisting of:

(A) linear and branched, saturated and unsaturated fatty alcohols containing from 10 to 30 carbon atoms, and mixtures of such alcohols; and

(B) esters of polyols containing from 2 to 5 carbon atoms with fatty acids containing from 10 to 30 carbon atoms which esters contain at least one free hydroxyl group, and mixtures of such esters;

and wherein from 0.1 mole to 3.0 moles of glyoxal is used per hydroxyl group in the hydrophobe.

4,295,931

SIZING METHOD AND SIZING COMPOSITION FOR USE THEREIN

David H. Dumas, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 33,618, Apr. 26, 1979, abandoned, which is a continuation of Ser. No. 875,663, Feb. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 665,140, Mar. 8, 1976, abandoned. This application Jun. 2, 1980, Ser. No. 155,040

Int. Cl.³ D21H *3/02*

U.S. Cl. 162—158 **4 Claims**

1. In the method of producing sized paper wherein there is employed in the internal or external sizing thereof an aqueous emulsion of a hydrophobic cellulose reactive sizing agent selected from the group consisting of ketene dimers, acid anhydrides, and organic isocyanates, the improvement wherein there is employed in combination with the sizing agent a sizing accelerator, said accelerator being selected from a water-soluble poly(diallylamine)-epihalohydrin resin and a water-soluble poly(N-methyldiallylamine)-epihalohydrin resin in an amount sufficient to increase the off-the-machine sizing effect of the sizing agent, the amount of epihalohydrin used in reaction with the poly(diallylamine) being from about 0.5 mole to about 1.5 moles per mole of secondary amine present in the polymer and the amount used in reaction with the poly(N-methyldiallylamine) being from about 0.5 mole to about 1.5 moles per mole of tertiary amine present in the polymer.

4,295,932

SYNERGISTIC BLEND OF BIOCIDES

Frances C. Pocius, Westmont, Ill., assignor to Naloc Chemical Company, Oak Brook, Ill.

Filed Jul. 14, 1980, Ser. No. 168,858

Int. Cl.³ D21H *5/22*

U.S. Cl. 162—161 **5 Claims**

1. A method for controlling aqueous systems heavily contaminated with microorganisms comprising treating such systems with 0.5–10 ppm of a mixture of 75% of 5-chloro-2-methyl-4-isothiazolin-3-one and 25% 2-methyl-4-isothiazolin-3-one and an effective amount of chlorine or chlorine dioxide, such amount being substantially effective with said mixture to control microorganisms in the aqueous system.

4,295,933

PRODUCING DISPERSIONS OF PREFLOCCULATED FILLERS FOR USE IN PAPERMAKING

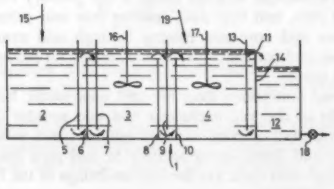
David E. Smith, Longfield, England, assignor to Blue Circle Industries Limited, London, England

Continuation of Ser. No. 923,347, Jul. 10, 1978, abandoned. This application Apr. 3, 1980, Ser. No. 137,476

Claims priority, application United Kingdom, Jul. 12, 1977, 29209/77

Int. Cl.³ D21H *3/82*

U.S. Cl. 162—168 NA **25 Claims**



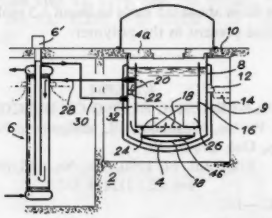
1. In a method of supplying filler to a papermaking furnish which comprises the steps of forming preflocculated filler and then adding it to papermaking furnish, the improvement which comprises forming the preflocculated filler by continuously forming a suspension of polymeric binder in particulate form in water in which the concentration of the binder solids in the suspension is at least 0.5 percent by weight, said binder being a starch-based polymer; continuously passing the formed suspension through a zone wherein the suspended particulate polymeric binder is allowed to swell in the water and is subjected to shear; regulating the rate of continuous flow of the resulting dispersion through the zone, and the degree of shear applied, so that the residence time of the dispersed polymeric binder in the zone is at least sufficient for optimum swelling of said polymeric binder in the water and the resulting solution of polymeric binder in the water is visually homogeneous; continuously passing said solution to the papermaking furnish; and introducing filler into the water sufficiently in advance of contact of said solution with the papermaking furnish such that said filler is preflocculated prior to contact thereof with the papermaking furnish.

4,295,934

LIQUID-METAL-COOLED NUCLEAR REACTOR

Marcel Robin, 25, Avenue de l'Europe, 92310 Sevres, France

Filed Jun. 22, 1979, Ser. No. 51,517
Claims priority, application France, Jun. 23, 1978, 78 18823
Int. Cl.³ G21C *15/00, 11/08*
U.S. Cl. 376—203 **6 Claims**



1. A liquid metal cooled nuclear reactor comprising:

a core constituted by a plurality of fuel-assemblies provided with a tubular bottom fitting and by its neutronic protection means;

a main vessel comprising a bottom portion, a lateral wall and first supporting means arranged at a determined level, said first means being integral with the outer surface of said lateral wall;

a primary vessel, mounted inside said main vessel and coaxial therewith, said primary vessel comprising a corediagrid for supporting and feeding the reactor core, a lateral wall and second supporting-means integral with the primary vessel lateral wall and with the main vessel lateral wall, respectively, the two laterial walls of said two vessels defining an annular space;

a semi-tight horizontal partition in said annular passage;

at least one heat-exchanger outside said vessels for ensuring a heat-exchange between said hot liquid metal and cold water;

a first connection duct for the hot metal between the inlet of said exchanger and the inside of the primary vessel above said core, said first duct opening into said primary vessel above said core and passing through said annular space above said horizontal partition by means for passing through said space;

a second connection duct for said cold metal, between the outlet of the said exchanger and said annular space, said second duct opening into said annular space, so as to cause said cold liquid metal to flow in said core diagrid, then through said core, via the bottom-fittings of the fuel-assemblies, wherein:

said first supporting means and said second supporting means are substantially at the same horizontal level, said level being, in addition, in the vicinity of the level of said first and said second connecting ducts;

said primary vessel is constituted by an inner sleeve extending over at least a portion of the height of the lateral wall of the primary vessel, and an outer sleeve, parallel with said inner sleeve, said sleeves defining an interstice, containing thermally insulating means, said interstice being connected, in the lower portion thereof, to a manifold mounted under said core diagrid, for collecting the leaks of the liquid metal at the core bottom and the outer sleeve comprises a plurality of orifices opening into said annular space above said semi-tight horizontal partition;

the portion of said first duct passing through said annular space is surrounded by thermally insulating means adapted to withstand the differential expansion between said two vessels;

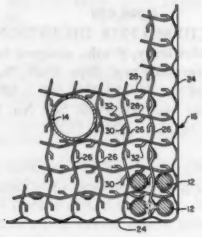
said semi-tight horizontal partition is constituted by said second supporting means, the latter being provided with calibrated orifices.

4,295,935

BIMETALLIC SPACER MEANS FOR A NUCLEAR FUEL ASSEMBLY

Andrew J. Anthony, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 29, 1979, Ser. No. 25,228
Int. Cl.³ G21C *3/30*
U.S. Cl. 376—285 **7 Claims**



1. In a fuel assembly of the type that is employable in a nuclear reactor core and has a definable exterior surface, the fuel assembly including a multiplicity of fuel rods and at least one nuclear fuel assembly spacer grid, said nuclear fuel assembly spacer grid including perimeter means and first and second means each structurally associated with said perimeter means, said perimeter means including a plurality of perimeter strips each made of zircaloy and having their ends interconnected together to form a closed perimetric structure positioned in surrounding relation to said multiplicity of fuel rods thereby defining the exterior surface of the fuel assembly, said first means being operable to provide lateral support to said multiplicity of fuel rods, said second means being operable to effect the proper spacing between said multiplicity of fuel rods, the improvement comprising expandable means cooperatively associated with said perimeter means so as to be operable to preclude in-reactor bowing of the fuel assembly, said expandable means comprising a plurality of expandable strips each being formed from a material having a high thermal coefficient of expansion than zircaloy, said plurality of expandable strips being attached to said plurality of perimeter strips in equally spaced relations one to another, said plurality of expandable strips being thermally expandable between a first position wherein said plurality of expandable strips are located in relatively close proximity to the exterior surface of the fuel assembly and a second position wherein said plurality of expandable strips are displaced laterally relative to the exterior surface of the fuel assembly so as to preclude in-reactor bowing of the fuel assembly by occupying the space adjacent to the exterior surface of the fuel assembly otherwise available for receiving portions of the fuel assembly that have undergone bowing.

4,295,936

FRACTIONATION APPARATUS PROVIDING IMPROVED HEAT RECOVERY FROM BOTTOM STREAM

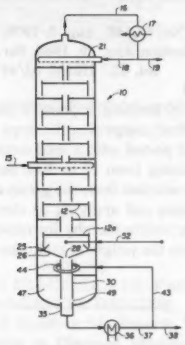
Robert A. Farnham, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 28, 1979, Ser. No. 53,124
Int. Cl.³ B01D *3/38*
U.S. Cl. 202—153 **9 Claims**

1. In a fractionation apparatus comprising a vertically elongated fractionation column having a plurality of trays disposed therein, including a lowermost tray in a lower portion of said column, means for introducing a feed stream into the column at a point between the top and bottom thereof, means for removing a stream from a portion of said column above said feed means, means for removing a bottoms stream from a portion of said column below said feed means, and means for providing a

recycle portion of said bottoms stream to a lower portion of said column,

the improvement which comprises a perforated generally annular baffle positioned within a lower portion of said column for directing fluid from the generally cylindrical fluid-retaining space within said baffle to said bottoms stream removal means, said baffle (a) extending upwardly from the bottom portion of said column and forming between said baffle and the lower side portion of said column a generally annular fluid-retaining space, (b) said cylindrical fluid-retaining space being in fluid communication via said perforations with said annular fluid-retaining space, and (c) the lower portion of said cylindrical fluid-retaining space being in fluid communication with said bottoms stream removal means; means for directing fluid from said lowermost tray into said cylindrical fluid-retaining space, said fluid-directing means being positioned above and spaced apart from said baffle and being in open fluid communication with the top of said cylindrical fluid-retaining space; and said bottoms stream recycle means providing said portion of said bottoms stream to said annular fluid-retaining space.



4,295,937

RECTIFIER

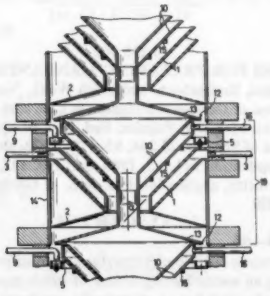
Manfred Mayer, Niedernhausen, and Roland Volz, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,294

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911214

Int. Cl.³ B01D *3/14*

U.S. Cl. 202—155 **10 Claims**



1. A rectifier for separating a refineable substance by evaporation to a vapor and condensation to a liquid, the rectifier being comprised of a plurality of individual modules arranged atop one another, each such module comprising:

a peripheral module wall;

evaporator means for vaporizing said substance and having a surface inclined downward in the direction of the axis of the module, an upper rim, a lower rim, and a liquid guide element for said liquid at the lower rim thereof inclined downward toward said module wall;

a distributor channel disposed above the upper rim of the evaporator means for distributing the liquid thereto, the distributor channel being positioned to receive the liquid from the guide element of the module just above;

condenser means for condensing said vapor to a liquid, having at least one drain element thereon for channelling the condensed liquid; and

a vapor guide element for guiding to the condenser means vapor from the module just below.

4,295,938

COKE-OVEN DOOR ASSEMBLY

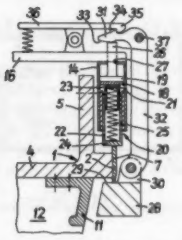
Friedhelm Haaf, Velbert, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Sep. 23, 1980, Ser. No. 190,166

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939070

Int. Cl.³ C10B *25/06*

U.S. Cl. 202—248 **10 Claims**



1. A coke-oven door assembly comprising:

a doorjamb having an outwardly facing annular doorjamb surface;

a rigid door body having an annular outer edge aligned with and generally perpendicular to said doorjamb surface;

an annular and hollow rigid frame juxtaposed with said edge;

an annular seal strip engaging said edge and bearing inwardly on said doorjamb surface;

a rail inside said frame and movable toward and away from said doorjamb surface;

a plurality of elastically compressible biasing devices engaged between said rail and said strip and urging same toward said doorjamb surface; and

means including a plurality of spacers engaged between said doorjamb and said rail for maintaining said rail at a predetermined spacing from said doorjamb.

4,295,939

METHOD AND DEVICE FOR DETECTING A GASEOUS ANHYDRIDE IN AN OXYGEN BEARING GAS

Marc Poirier, Chomedey; Michel Gauthier, Laprairie, and Andre Belanger, Ste-Julie, all of Canada, assignors to Hydro-Quebec, Montreal, Canada

Filed Nov. 30, 1979, Ser. No. 98,978

Claims priority, application Canada, Mar. 30, 1979, 324693

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—1 T **31 Claims**

1. A device for detecting a gaseous anhydride and measuring

its concentration in an oxygen-bearing gas, said device comprising:

a first solid-electrolyte element containing oxyanions of the anhydride to be detected;

a first reference electrode in contact with said first electrolyte element;

means for fixing a constant potential near this first reference electrode;

a second, O^{--} ion-conducting, solid-electrolyte element, said solid-electrolyte element being spaced from said first reference electrode and in direct contact with said first electrolyte element so as to create an electrolytic junction;

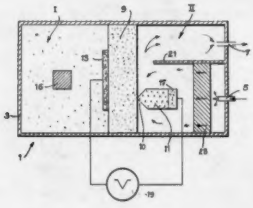
a second reference electrode in contact with said second electrolyte element, said second reference electrode being spaced from said electrolytic junction;

means for fixing a constant potential near this second reference electrode;

means for bringing the gas containing the gaseous anhydride to be detected into contact with the electrolytic junction formed by the first and second electrolyte elements so as to form a triple junction, means for preventing contact of said gas and said first reference electrode;

a potentiometer connected to said reference electrodes to measure the difference of potential existing between said reference electrodes when the gas containing the gaseous anhydride to be detected is in contact with the electrolytic junction formed by the first and second electrolyte elments, and

means for heating said triple junction to a temperature at which a logarithmic variation in the concentration of the



anhydride to be detected produces a proportional, virtually linear variation in the measured difference of potential, provided that said temperature is lower than the melting temperatures of said first and second electrolyte elements.

22. A method for detecting a gaseous anhydride and measuring its concentration in an oxygenbearing gas by measurement of a difference of potential, characterized in that it comprises the following steps:

forming an electrolytic junction by contact between a first solid-electrolyte element containing oxyanions of the anhydride to be detected and a second, solid-electrolyte element containing O^{--} ions;

bringing the gas containing the gaseous anhydride to be detected into contact with said electrolytic junction formed by the first and second electrolyte elements to form a triple junction;

creating in this triple junction a difference of potential measurable by means of two reference electrodes in contact with said first and second electrolyte elements respectively, by fixing a constant potential in the vicinity of each of said reference electrodes, said reference electrodes being both spaced from the triple junction, the reference electrode in contact with said first electrolyte element being out of contact with the anhydride containing gas;

heating said triple junction to a temperature at which a logarithmic variation in the concentration of the anhydride to be detected produces a proportional, virtually linear variation in the difference of potential in said triple junction, said temperature being lower than the melting temperatures of said first and second electrolyte elements, and

measuring said difference of potential with a potentiometer connected to said reference electrodes so as to obtain a measurement of the concentration of the anhydride to be detected.

4,295,940

METHOD FOR BATTERY PLATE

Brajendra P. Varma, Levittown, Pa., assignor to Eltra Corporation

Division of Ser. No. 64,650, Aug. 7, 1979, Pat. No. 4,230,779. This application Aug. 29, 1980, Ser. No. 182,346

Int. Cl.³ H01M *10/44*

U.S. Cl. 204—2.1 **2 Claims**

1. A method of forming a positive plate for a lead acid battery, said method comprising the steps of immersing a lead or lead alloy grid pasted with a lead oxide composition in an electrolyte containing from 10 to 5000 parts per million of at least one element selected from the group consisting of manganese and chromium, and applying an electric current to said grid and said electrolyte thereby introducing from 0.1 to 0.4 percent based upon the weight of said plate of said element into said plate.

4,295,941

METHOD OF MANUFACTURING A METAL CERAMIC DENTAL RESTORATION

Stewart J. Lustgarten, Holliston, Mass., assignor to Healthco Inc., Boston, Mass.

Filed Dec. 7, 1979, Ser. No. 101,203

Int. Cl.³ A61C *5/08*

U.S. Cl. 204—35 R **5 Claims**

1. A method of manufacturing a fixed prosthodontic metal ceramic dental restoration comprising casting a metal framework from a metal composition comprising an alloy of nickel and chromium having at least 4% nickel, electroplating a thin film deposit of gold between about 0.4 to 1 mil in thickness over a predetermined surface area of said framework with said gold deposit being in intimate contact with the nickel chromium alloy; distributing finely divided particles containing a major proportion of gold which vary in size between 1 to no more than about 20 microns over said electroplated gold surface and firing successive layers of porcelain over said predetermined surface area in a firing temperature range of between about 1600° F. to 1900° F. whereby the firing of said porcelain layers simultaneously causes said finely divided particles to form beads of substantially globular shape.

4,295,942

PROCESS FOR PREPARING MANGANESE OXIDE

Konrad Koziol, Rothenbach, and Erich Wenk, Nuremberg, both of Fed. Rep. of Germany, assignors to Conradty GmbH & Co. Metallelektroden KG, Pegnitz, Fed. Rep. of Germany

Continuation of Ser. No. 23,346, Mar. 23, 1979, abandoned. This application Feb. 15, 1980, Ser. No. 122,060

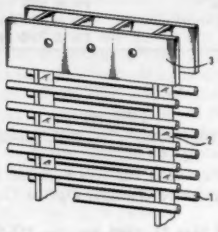
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853820

Int. Cl.³ C25B *1/18*

U.S. Cl. 204—96 **12 Claims**

1. The process for the electrolytic preparation of maganese oxides using an anode having a core of valve metal, the working surface of which has an electrically conductive, corrosion-resistant, mechanically solid coating which impedes the passivation of the core, wherein the working surface of the anode

comprises the surfaces of a plurality of rods which are mounted in parallel, and the rods are connected by conductive



supports, wherein the desired electrolysis product is a solid and not a gas.

4,295,943

PROCESS FOR THE ELECTROLYTIC PRODUCTION OF MANGANESE DIOXIDE

Nenad R. Tomov, and Geoffrey M. Roberts, both of Geneva, Switzerland, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed Apr. 17, 1980, Ser. No. 141,199

Int. Cl.³ C25B 1/18

U.S. Cl. 204—96 **8 Claims**

1. A process for the electrolytic production of manganese dioxide comprising electrolyzing an aqueous manganese containing electrolyte between a flexible anode and a cathode to deposit manganese dioxide on the anode, flexing the anode to fracture and remove the manganese dioxide deposit and recovering the manganese dioxide without removing the anode from the cell.

4,295,944

ELECTROLYSIS OF AQUEOUS SOLUTION OF ALKALI METAL CHLORIDE

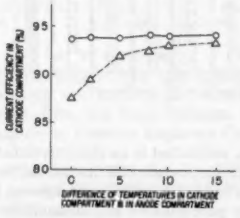
Takao Satoh, and Toru Seita, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Jul. 8, 1980, Ser. No. 166,787

Claims priority, application Japan, Sep. 11, 1979, 54-115659

Int. Cl.³ C25B 1/34

U.S. Cl. 204—98 **9 Claims**



3. The method of claim 2, wherein said temperature range is a difference of from 4° C. to 8° C.

4,295,945

PROCESS FOR THE PRODUCTION OF LIQUID CHLORINE

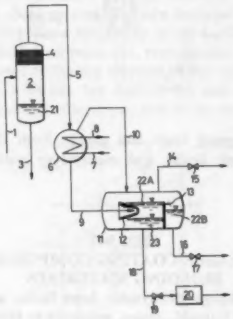
Dieter Bergner; Kurt Hannesen, both of Kelkheim; Wolfgang Müller, Bad Soden am Taunus, and Wilfried Schulte, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 2, 1980, Ser. No. 146,020

Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2917974

Int. Cl.³ C25B 1/26

U.S. Cl. 204—128 **10 Claims**



1. A process for the production of liquid chlorine comprising the steps of

electrolyzing an aqueous alkali metal chloride solution in an electrolytic cell under an operational pressure of at least 8 bars and at an anolyte temperature above the boiling point of chlorine at the operational pressure;

obtaining from the electrolysis a mixture of anolyte and steam-saturated gaseous chlorine in an anode space of the electrolytic cell;

separating the anolyte from the steam-saturated gaseous chlorine;

liquefying the steam-saturated gaseous chlorine under a pressure of at least 8 bars to a condensate after the steam-saturated chlorine passes out of the electrolytic cell by cooling the steam-saturated gaseous chlorine, said cooling comprising maintaining a temperature of at least 28° C. of the condensate which includes a liquid water-saturated chlorine phase and a liquid chlorine-saturated water phase; and

separating the water phase from the chlorine phase which has a heavier specific weight than the water phase.

4,295,946

METHOD AND APPARATUS FOR ELECTROCHEMICAL PURIFICATION OF CONTAMINATED LIQUIDS

Miron M. Nazarian, ulitsa Bijukhera, 13, kv. 138; Vyacheslav T. Efimov, ulitsa Sumskaya, 59, Kv. 2; Alexandr A. Axenko, ulitsa Bairona, 152, kv. 25; Vladimir A. Kolyada, ulitsa Petrozavodskaya, 91a, kv. 30, and Ljudmila F. Shamsha, ulitsa Dinamovskaya, 3, kv. 23, all of Kharkov, U.S.S.R.

Filed Aug. 8, 1980, Ser. No. 176,334

Int. Cl.³ C02F 1/46

U.S. Cl. 204—149 **3 Claims**

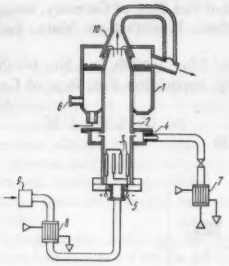
1. A method of electrochemical purification of contaminated liquids, comprising:

heating a contaminated liquid to a temperature at least in the order of 40° C.;

cooling an electrolyte to at least in the order of 25° C.;

passing said cooled electrolyte through a region having energized soluble electrodes provided within an electrocoagulation chamber;

mixing said heated contaminated liquid within said electrocoagulation chamber above said soluble electrodes with an ascending flow of said cooled electrolyte containing products of dissolution of said soluble electrodes;



separating formed foam and sludge from the mixture of contaminated liquid and electrolyte within a settling chamber.

4,295,947

PHOTO-CURABLE COATING COMPOSITIONS FOR BUILDING MATERIALS

Eiichi Ohtani; Kengo Kobayashi; Asao Isobe, and Shigeyoshi Tanaka, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 74,660
Claims priority, application Japan, Sep. 18, 1978, 53-114371
Int. Cl.³ C08F *2/50;* B32B *27/16*
U.S. Cl. 204—159.15 **2 Claims**

1. A photo-curable coating composition for building materials which comprises

(a) an isocyanate-modified epoxy ester obtained by the reaction of an acrylic or methacrylic ester of an epoxy compound having not less than two epoxy groups in the molecule with a polyisocyanate;

(b) a photopolymerizable monomer being copolymerizable with the epoxy ester (a);

(c) a ketone resin formed by condensation of a ketone with an aldehyde;

(d) a photo-sensitizer; and

(e) a sensitizing auxiliary,

the amounts of the constituents (a) to (e) being as follows:

0/100	$\leqq (b)/(a) + (b) \leqq$	70/100	(weight ratio)
1/100	$\leqq (c)/(a) + (b) \leqq$	50/100	(weight ratio)
0.5/100	$\leqq (d) + (e)/(a) + (b) \leqq$	15/100	(weight ratio)
0/1	$\leqq (e)/(d) \leqq$	3/1	(molar ratio)

4,295,948

PHOTOCURABLE ADHESIVE FROM ACRYLIC ACID, ACRYLAMIDE, DIMETHYLAMINOETHYL METHACRYLATE, BENZOPHENONE AND METHYL ETHYL KETONE

Alain Roman, Bossey; Pierre Chevreux, St. Jean de Gonvillo, both of France; Manfred Wüst, Dardagny, and Jacques Ehretsmann, Conches, both of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Division of Ser. No. 605,055, Aug. 15, 1975, abandoned. This application Sep. 20, 1979, Ser. No. 77,472
Claims priority, application Switzerland, Aug. 16, 1974, 11220/74; Aug. 16, 1974, 11221/74; Aug. 16, 1974, 11222/74
Int. Cl.³ C08F *220/56, 220/70, 226/10;* B32B *17/10*
U.S. Cl. 204—159.23 **2 Claims**

1. The photopolymerizable adhesive which consists of:

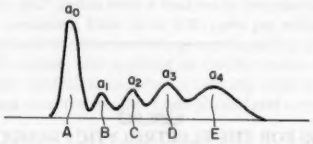
acrylic acid:	15% to 88.5% by weight
benzophenone:	0.5% to 10% by weight
methyl-ethyl-ketone:	1% to 60% by weight
dimethylamino-ethyl-methacrylate:	5% to 35% by weight and
acrylic amide:	5% to 35% by weight.

4,295,949

METHOD FOR DETERMINING BOUNDARY POINTS IN ELECTROPHORESIS

Toshihide Fujiwara, Fuchu, and Ryo Fujimori, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 21, 1980, Ser. No. 151,889
Claims priority, application Japan, May 25, 1979, 54-64814
Int. Cl.³ G01N *27/26*
U.S. Cl. 204—180 G **5 Claims**



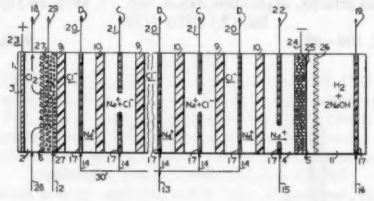
1. A method for determining boundary points in electrophoresis comprising a step to determine points on the abscissa corresponding to peak tops on a densitogram traced based on electrophoresis and select said points as standard positions, a step to locate said standard positions on a densitogram of an unknown sample traced based on electrophoresis of an unknown sample, a step to count number of points having minimum values existing between each pair of the neighboring standard positions on the densitogram of the unknown sample and a step to select the point having the minimum value as the normal boundary point when a single point is counted or the one corresponding to the lowest concentration as the normal boundary point when 2 or more points are counted.

4,295,950

DESALINATION WITH IMPROVED CHLOR-ALKALI PRODUCTION BY ELECTROLYTICDIALYSIS

Marc Cole, 1057 C Argyll Cir., Lakewood, N.J. 08701

Continuation-in-part of Ser. No. 71,991, Sep. 4, 1979, abandoned. This application Jun. 5, 1980, Ser. No. 156,735
Int. Cl.³ B01D *13/02;* C25B *1/34, 1/46*
U.S. Cl. 204—180 P **19 Claims**



8. In a process, conducted in an electrolyticdialysis cell, for the electrolytic decomposition of a first part of the alkali metal halide solute of a separately maintained aqueous brine to produce substantially pure chlorine and substantially pure caustic soda in concentrated solution and hydrogen, and for the concomitant electrodialysis in said cell of the solute of a further part of said separately maintained aqueous brine to form at

least partly desalinated water and salt enriched water, the improvement consisting, in combination, of the electrical discharge of the cations of said first part of said solute to atoms at an immobilized liquid metal amalgam filling the interconnected micro-pores of novel cathode immersed in a separately maintained sea water catholyte, and subsequent reaction of said atoms with water of dilute caustic soda solution in a denuding chamber abutting said novel cathode to form said substantially pure concentrated caustic soda solution and hydrogen, and further consisting, in said combination, of the electrical discharge of the anions of said first part of said solute at an anode immersed in a separately maintained substantially saturated metal chloride solution as anolyte, to form substantially pure chlorine, an electric current being passed between said anode and the amalgam of said novel cathode.

4,295,951

FILM-COATED CATHODES FOR HALATE CELLS

Tilak V. Bommaraju, Grand Island; Theodore H. Dexter, Lewiston, and Charles G. Rader, Grand Island, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 14, 1980, Ser. No. 149,814
Int. Cl.³ C25B *9/00, 11/03, 11/10*
U.S. Cl. 204—242 **11 Claims**

11. In an electrolytic halate cell comprising a cell container, an anode, a cathode, and an alkali metal halate solution, the improvement comprising eliminating the presence of chromium ions in the solution by utilizing, as said cathode, a film-coated cathode comprising a conductive substrate coated with an adherent, porous film of a substantially nonconductive, chemically inert material, said film having an average thickness of from about 10^{-4} microns to about 10^{3} microns, an average porosity of from about 1% to about 85%, and an average pore size of from about 0.1 microns to about 30 microns.

4,295,952

NOVEL CATIONIC MEMBRANES

Oronzio de Nora; Luigi Giuffre, and Giovanni Modica, all of Milan, Italy, assignors to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 138,290, Feb. 22, 1979, Pat. No. 4,246,090. This application Mar. 24, 1980, Ser. No. 133,521
Claims priority, application Italy, Jan. 17, 1979, 19354 A/79
Int. Cl.³ C25B *13/08*
U.S. Cl. 204—252 **7 Claims**

1. A membrane electrochemical cell comprising a cell housing containing at least one anode in an anode compartment and at least one cathode in a cathode compartment forming an interelectrodic gap with a cation exchange membrane separating the anode and cathode compartments with the sulfonated polymer facing the anodic side.

5. A fluid impermeable cation exchange membrane comprising a first layer of a water wettable and water insoluble sulfonated polymer of styrene and about 8 to 20 molar percent of divinylbenzene and a second layer of an unsulfonated polymer of divinylbenzene and at least one monomer selected from the group consisting of 2-vinylpyridine and 4-vinylpyridine in a molar ratio of styrene to vinylpyridine of about 1:8 to 1:1.

4,295,953

FILTER PRESS TYPE ION EXCHANGE MEMBRANE-METHOD ELECTROLYSIS CELL

Shigeaki Fuseya, Gifu, and Teruo Ichisaka, Tamano, both of Japan, assignors to Chlorine Engineers Corp., Ltd., Tokyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,029
Int. Cl.³ C25B *9/00, 15/08*
U.S. Cl. 204—257 **2 Claims**

1. A filter-press type ion exchange membrane-method electrolysis cell comprising

(a) an anode structure which comprises a rectangular anode frame including a top element, a bottom element and two side elements and anode plates welded to the anode frame,

(b) a cathode structure which comprises a rectangular cathode frame including a top element, a bottom element and two side elements and cathode plates welded to the cathode frame, and

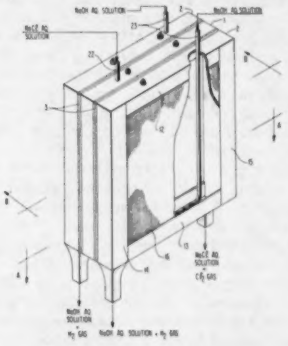
(c) an ion exchange membrane interposed between the anode structure and the cathode structure;

wherein

the two side elements of the anode frame and the two side elements of the cathode frame have a tubular structure with a rectangular cross section,

the top and bottom elements of the anode frame and the top and bottom elements of the cathode frame have a]-shaped cross section, and are secured such that their open portions face the inside of an anode compartment and a cathode compartment, respectively, and

at least one end of the top element of the anode frame communicates with the top end of the side element of the anode frame and at least one end of the top element of the



cathode frame communicates with the top end of the side element of the cathode frame so that the side element communicating with the top element of the anode frame, and the side element communicating with the top element of the cathode frame form conduits for withdrawing gas and solution flowing from the anode compartment and the cathode compartment, respectively,

(d) a current disperser surrounding an anode lead bar welded to anode plates within the anode structure and a current disperser surrounding a cathode lead bar welded to cathode plates within the cathode structure, whereby a region not permitting passage of gas is formed between the periphery of the anode lead bar and the inside of the current disperser welded to the anode plates and between the periphery of the cathode lead bar and the inside of the current disperser welded to the cathode plates, thus serving as a passage for a downwardly moving stream of electrolytic solution, and

(e) a pipe for supplying an anolyte solution disposed within the anode compartment and a pipe for supplying a catholyte solution disposed within the cathode compartment.

4,295,954

COAL CONVERSION CATALYSTS

Thomas O. Mitchell, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 18, 1979, Ser. No. 86,212
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—10 **5 Claims**

1. In a solvent extraction process for coal conversion wherein coal is slurried in an organic solvent and heated to a temperature sufficient to dissolve or liquefy most of the coal, the resulting coal liquefaction product is upgraded by catalytic

hydrogenation, and a process-derived recycle solvent is hydrogenated and returned to the initial dissolution stage; the improvement which comprises contacting a coal/solvent slurry, with a catalyst selected from the groups consisting of:

(1) spent hydrogenation catalyst from processes for the hydrogenation of hydrocarbons selected from the group consisting of petroleum, petroleum-derived liquids, Fischer-Tropsch liquids, and shale oils;

(2) spent adsorbent from guard chambers used to demetallize said hydrocarbons; and

(3) mixtures thereof.

4,295,955

ATTENUATION OF METAL CONTAMINANTS ON CRACKING CATALYST WITH A BORON COMPOUND

Hosheng Tu, Shorewood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 10, 1980, Ser. No. 129,003
Int. Cl.³ C10G *11/04*
U.S. Cl. 208—120 **7 Claims**

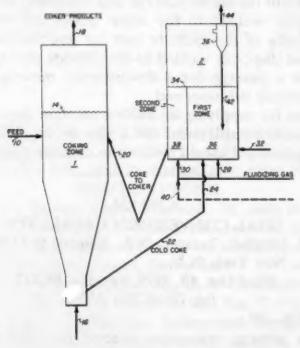
1. A process for attenuating a metal on fluidized cracking catalyst which has been contaminated with said metal, said catalyst being used in a fluidized cracking system wherein said catalyst is cycled between a cracking zone, in which said catalyst is contacted at cracking temperature with a hydrocarbon feedstock, and a regeneration zone, in which carbonaceous residual material is oxidized and thereby removed from said catalyst, the source of said metal contaminant being said feedstock or residual metals resulting from the synthesis of said catalyst, which process comprises withdrawing a portion of said catalyst being transferred from said regeneration zone to said cracking zone as a slip stream, passing said slip stream to an independent attenuation zone, wherein said withdrawn portion of said catalyst is cooled to a temperature less than about 100° C. and thereafter is contacted with an aqueous solution of a boron compound to impregnate said boron compound upon said catalyst, drying said impregnated catalyst to remove water resultant from said aqueous solution, calcining said dried impregnated catalyst at a temperature of from about 425° C. to about 815° C. and adding said dried and calcined impregnated catalyst from said attenuation zone to the remaining portion of the catalyst being transferred from said regeneration zone to said cracking zone.

4,295,956

FLUID COKING PROCESS

William J. Metrailer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 3, 1980, Ser. No. 126,400
Int. Cl.³ C10G *9/32*
U.S. Cl. 208—127 **11 Claims**



1. In a coking process comprising the steps of:

(a) contacting a carbonaceous chargestock under fluid coking conditions in a coking zone comprising a first bed of fluidized solids to produce a vapor phase product, including normally liquid hydrocarbons, and coke, said coke depositing on said fluidized solids;

(b) passing a portion of said solids with a coke deposit thereon to a vessel comprising a second bed of fluidized solids, and

(c) passing a portion of solids from said second vessel to said coking zone, the improvement which comprises: said fluid bed in said second vessel being divided into two zones, introducing a fluidizing gas into the first of said zones in an amount sufficient to provide a superficial gas velocity at least sufficient to maintain said solids fluidized and introducing a fluidizing gas into the second of said zones in an amount sufficient to provide in said second zone a superficial gas velocity ranging from about 1.5 to about 5 times the superficial gas velocity of said first zone, said superficial velocity of said second zone being at least two feet per second, to entrain solid fines out of said second zone, and passing a portion of solids from said second zone to said coking zone.

4,295,957

REFORMING WITH MULTIMETALLIC CATALYSTS

Charles H. Mauldin, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 34,596, Apr. 30, 1979, Pat. No. 4,251,392. This application Jul. 14, 1980, Ser. No. 168,491
Int. Cl.³ C10G *35/09*
U.S. Cl. 208—138 **15 Claims**

1. A process for reforming a hydrocarbon feed at reforming conditions which comprises palladium and platinum in total concentration ranging from about 0.2 to about 0.6 percent, with from about 15 to about 50 mol. percent of the composition being platinum, as contrasted with the amount of palladium contained in the composition, from about 0.1 to about 2 percent rhenium, and from about 0.01 to about 0.1 percent copper, composited with an inorganic oxide support.

4,295,958

REFORMING WITH MULTIMETALLIC CATALYSTS

Charles H. Mauldin, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 29,675, Apr. 13, 1979, Pat. No. 4,251,391. This application Jul. 14, 1980, Ser. No. 168,492
Int. Cl.³ C10G *35/09*
U.S. Cl. 208—138 **23 Claims**

1. A process for reforming a hydrocarbon feed at reforming conditions which comprises contacting said feed with a catalyst which consists essentially of from about 0.1 to about 2 percent platinum, from about 0.1 to about 2 percent rhenium, and from about 0.01 to about 0.1 percent copper composited with an inorganic oxide support.

4,295,959

HYDROCARBON DEHYDROCYCLIZATION WITH AN ATTENTUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 48,957, Jun. 15, 1979, Pat. No. 4,229,319, which is a division of Ser. No. 954,684, Oct. 25, 1978, Pat. No. 4,206,040, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Oct. 20, 1980, Ser. No. 198,733
Int. Cl.³ C07C *15/8*; B01J *27/08*; C10G *35/09*
U.S. Cl. 208—138 **25 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at hydrocarbon dehydrocyclization conditions with an acidic cata-

lytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing catalytically effective amounts of a halogen component, a silver component and a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state.

4,295,960

HYDROCARBON DEHYDROCYCLIZATION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 36,120, May 4, 1979, Pat. No. 4,231,897, which is a division of Ser. No. 947,906, Oct. 2, 1978, Pat. No. 4,193,863, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, now Pat. No. 4,165,276. This application Nov. 3, 1980, Ser. No. 203,018

1980, Ser. No. 203,018

Int. Cl.[3] **C07C** *15/08;* **C10G** *35/09;* **B01J** *27/08*

U.S. Cl. 208—139 **25 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at hydrocarbon dehydrocyclization conditions with an acidic catalyst composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing catalytically effective amounts of a halogen component, a cadmium component and a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state.

4,295,961

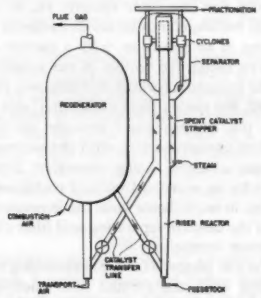
METHOD AND APPARATUS FOR IMPROVED FLUID CATALYTIC RISER REACTOR CRACKING OF HYDROCARBON FEEDSTOCKS

Robert J. Fahrig, Lansing, and Lansing M. Hinrichs, Chicago, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 23, 1979, Ser. No. 96,939

Int. Cl.[3] **C10G** *11/18*

U.S. Cl. 208—161 **4 Claims**



1. In a method for the fluid catalytic cracking of hydrocarbon feedstocks wherein an ascending cocurrent stream of vaporous hydrocarbons and entrained catalyst particulates whose upward flow is at a rate substantially less than the flow rate of said hydrocarbons is effected in an elongated conduit reaction zone, the improvement which comprises:

(1) altering the direction of flow of said stream of hydrocarbons and catalyst particulates to a downward direction by conducting said stream into a flow reversal means which discharges into a downwardly directed flow reversal conduit;

(2) accelerating the rate of downward flow of said catalyst particulates by gravitational force augmenting fluid flow drag forces to impart downward momentum thereto;

(3) withdrawing cracked hydrocarbon products laterally from the downwardly flowing catalyst particulates and passing said products directly into cyclone separator means thereby effecting rapid disengagement of said cracked hydrocarbon products from said catalyst particulates; and

(4) contacting the downwardly flowing catalyst particulates with an ascending flow of inert stripping gas after substantial withdrawal of said cracked hydrocarbon products, the downward momentum of said catalyst particulates preventing their passage laterally with the cracked hydrocarbon products and permitting their passage countercurrent to the upward flow of inert stripping gas.

4,295,962

RECOVERING COPPER BY FLOTATION USING N-MERCAPTOALKYL AMIDE DEPRESSANT

Robert M. Parlman, and Ralph P. Williams, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1980, Ser. No. 145,093

Int. Cl.[3] **B03D** *1/06*

U.S. Cl. 209—167 **6 Claims**

1. A process for recovering copper-bearing mineral sulfides from a metallurgical concentrate, said process comprising in a froth flotation process admixing (1) froth floated metallurgical concentrate containing copper-bearing sulfides with (2) an amount of N-mercaptoalkyl amide sufficient to depress the flotation of said copper-bearing mineral sulfide and recovering the non-floated copper-bearing mineral sulfides.

4,295,963

BACKWASHABLE FLUID FILTER

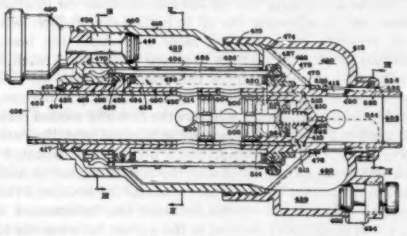
Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Feb. 7, 1980, Ser. No. 119,388

Claims priority, application Israel, Feb. 15, 1979, 56682

Int. Cl.[3] **B01D** *29/38*

U.S. Cl. 210—108 **15 Claims**



1. A backwashable filtering device including a housing having an inlet connectable to an upstream fluid pipe and an outlet connectable to a downstream fluid pipe, a filter body having an upstream surface communicating with the housing inlet to intercept dirt particles in the fluid flowing in the foreward direction from the housing inlet to the housing outlet, a backwash nozzle within the housing and having a nozzle inlet disposed adjacent to the upstream surface of the filter body, means for effecting relative movement between the filter body and the backwash nozzle, and means for connecting the backwash nozzle to the atmosphere for backwashing the filter body; characterized in that the device further includes a valve assembly movable to open or close a passage between the filter body and the housing outlet, spring means tending to move the valve assembly to close said passage, and pressure means for applying to the valve assembly the pressure at a point upstream

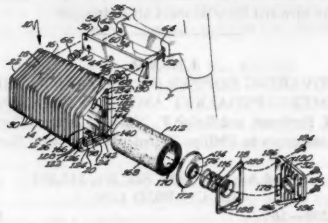
of the valve assembly tending to move same to open said passage, whereby under low pressure conditions the valve assembly closes or restricts said passage to the outlet and thereby maintains the pressure for backwashing the filter body via the nozzle.

4,295,964

MOTORCYLE APPARATUS

James M. Preisler, Bloomington, Minn., assignor to Thomas H. Rudd, Wayzata, Minn.

Filed Feb. 4, 1980, Ser. No. 118,021
Int. Cl.³ B01D *27/10*
U.S. Cl. 210—130 **19 Claims**



1. Device for filtering and cooling oil for attachment to a motorcycle comprising, in combination: an oil filter having a shape and an oil flow passageway including at least one opening; a casing having an outside surface and an inside surface; internal heat dissipating members extending from the inside surface of the casing for retarding oil flow therearound and for receiving and transferring heat from the oil to the casing; external heat dissipating members extending from the outside surface of the casing for receiving and transferring heat from the casing to the atmosphere, with the internal heat dissipating members terminating in and defining an oil filter capturing cavity of a shape and size for receiving the oil filter; an oil filter seat member located within the oil filter capturing cavity of the casing for seating with the opening of the oil filter; first means for allowing oil flow into the oil flow passageway of the oil filter; second means for allowing oil flow out of the casing; and third means for biasing the oil filter toward the oil filter seat member and for allowing the oil to bypass the oil filter when the oil pressure inside the oil filter overcomes the biasing means thus causing the oil filter to unseat from the seat member and allow oil to escape from the opening in the oil filter, wherein the casing includes a front, a back, a top, a bottom, a first side, and a second side, wherein the first and second means are located in the bottom, wherein the internal heat dissipating members comprise, in combination: a first shoulder located in the corner between the front and the top; a second shoulder located in the corner between the front and the bottom; a third shoulder located in the corner between the bottom and the back; a fourth shoulder located in the corner between the top and the back, and wherein a longitudinal cross section of the casing through the front, back, top, and bottom is an isosceles trapezoid.

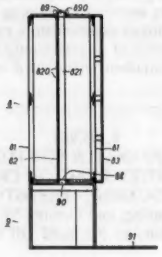
8. Apparatus for mounting an accessory to a motorcycle frame, with the accessory including a back, comprising, in combination: at least a first member securable to the motorcycle frame, with the securable member including an elongated portion having an enlarged end; a mounting plate having a shape and a thickness, with the mounting plate including at least a first aperture having a size allowing the elongated portion of the securable member to pass therethrough but preventing the enlarged end of the securable member from passing therethrough; at least a first aperture formed in the back of the accessory and having a shape and size complementary to and for receiving the enlarged end of the securable member; means for securing the mounting plate to the back of the accessory with the securable member outstanding from the mounting plate and extending through the mounting plate aperture and with the enlarged end captured within the accessory aperture by the mounting plate; two abutting members located on opposite sides of the accessory aperture for providing a three point connection with the securable member for preventing the accessory from turning or twisting about the securable member.

4,295,965

MULTI-FILTER CHAMBER AQUARIUM FILTER

Siegfried Köster, Paulsdorfer Strasse 2, D-8000 München 2, Fed. Rep. of Germany

PCT No. PCT/DE79/00006, § 371 Date Aug. 2, 1979, § 102(e) Date Aug. 2, 1979
PCT Filed Jan. 20, 1979, Ser. No. 63,115
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802908
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—169 **10 Claims**



1. Aquarium filter for combination with and connection to a suction device (**107–109**) having

an essentially box-like filter cassette (**6, 8**) of elongated, essentially rectangular cross section adapted for vertically positioning in an aquarium, with a narrow dimension of the cassette facing the bottom of the aquarium,

in which the cassette is formed to define two filter chambers (**65, 67, 85, 86**) spaced from each other, and a clear-water chamber (**66, 84**) positioned between the filter chamber and in fluid communication with the suction device, said clear-water chamber being separated from said filter chambers by an apertured vertical partitioning wall;

and wherein, in accordance with the invention,

the walls of the cassette separating said filter chambers from the aquarium comprise

removable cover plates (**61, 62, 81**) extending parallel to the partitioning wall, and formed with openings (**610, 620, 810**) therein to permit aquarium water to pass therethrough and into the filter chambers, while permitting individual removal of filter material from the filter chambers;

the cassette is formed with a lower opening (**88**) in communication with the clear-water chamber (**66, 84**);

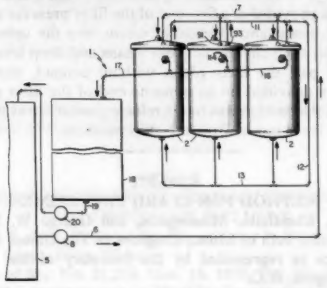
and the suction box (**1, 3, 9**) is essentially of rectangular or square cross section fitting against said narrow dimension of the cassette and positioned beneath the cassette, said suction box being formed with means (**70, 90**) communicating with the lower opening in the cassette and hence with the clear-water chamber (**66, 84**) at the side of the box in engagement with the cassette.

4,295,966

APPARATUS FOR REMOVING CONTAMINANTS FROM LUBRICATING OIL

Ralph W. LeBlanc, and Robert M. Bingham, both of P.O. Box 52734, New Orleans, La. 70152

Filed Jul. 17, 1980, Ser. No. 169,893
Int. Cl.³ B01D *35/18*
U.S. Cl. 210—180 11 Claims



1. A refiner for removing contaminants from lubricating oil comprising:

(a) a fluid containment vessel having a top and a generally vertical axis.

(b) a plate removably secured in said vessel and dividing said vessel into an upper chamber and a lower chamber; said plate having an upper surface; said surface having a domed shape with a generally smooth arcuate configuration and being raised in a center portion thereof above the remainder thereof; said plate also having a plurality of passageways extending from a lower side of said plate whereat said passageways communicate with said lower chamber to said surface near said center portion thereof;

(c) filter media located in said vessel lower chamber;

(d) first conducting means for delivering the oil to said vessel and communicating with said vessel lower chamber such that oil entering said vessel passes through said filter media, then through said passageways, and then flows over said surface;

(e) second conducting means for removing the oil from said vessel after the oil has passed over said dispersion plate; and

(f) venting means for exhausting said vessel upper chamber;

(g) whereby solid contaminents in the oil are substantially removed by said filter media and whereby volatile contaminents in the oil are substantially removed by evaporation while the oil is on said surface in a thin uniform manner even when said vessel axis is canted from vertical and the evaporated volatile contaminants are exhausted from said vessel upper chamber by said venting means.

4,295,967

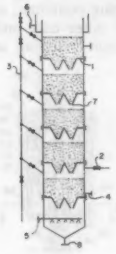
FLUIDIZED BED CONTACT APPARATUS

Akinori Kurima; Yasuhiro Iwase, and Tadao Kimiwada, all of Yokohama, Japan, assignors to Chiyoda Kako Kensetsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 952,639, Oct. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 625,777, Oct. 24, 1975, abandoned. This application May 23, 1980, Ser. No. 62,049
Claims priority, application Japan, Oct. 26, 1974, 49-123028
Int. Cl.³ B01D *15/02*
U.S. Cl. 210—189 3 Claims

1. An apparatus adapted for contact between divergent materials, and capable of forming a fluidized bed condition, comprising:

a plurality of trays, each of said plurality of trays being structured so as to have thereon a multiplicty of inverted frustum-shaped depressions adjacent to each other, each of said inverted frustum-shaped depressions being shaped so as to have a widened upper opening and inner lateral faces which incline inwardly from said upper opening to a narrowed lower opening at the bottom of said inverted frustum-shaped depressions, said trays being positioned vertically over each other so as to form a tower, said trays being positioned in such a manner that the lower narrowed opening of each of said inverted frustum-shaped depressions is vertically skewed with respect to each of the lower narrowed openings in each of the inverted



frustum-shaped depressions in the next vertically positioned tray, in said tower;

a housing surrounding said trays so as to form a support for said tower;

a particulate feeding means provided on said tower with respect to each of said trays;

a particulate material withdrawing means located on said tower;

a liquid feeding means located on said tower; and

a liquid discharge means located on said tower.

4,295,968

SEPARATING MATERIALS FOR THIN LAYER CHROMATOGRAPHY AND THEIR PREPARATION

Herbert Halpaap, Jugenheim, and Karl-Friedrich Krebs, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,595
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712113
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—198.3 12 Claims

1. In a separating material for thin-layer chromatography, comprising a substrate material having a coating thereon which coating comprises a thin sorbent layer, the improvement wherein the sorbent layer has a surface modified by reacting the sorbent layer with a silanizing agent without the exclusion of moisture.

4,295,969

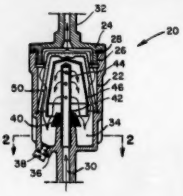
MAGNETIC FUEL PURIFIER WITH ROTATING PRE-PURIFIER

Gideon Hagberg, Halmstad, Sweden, assignor to Gunner Berg, Glumslov and Sven-Olle Strömberg, Helsingborg, both of, Sweden

Filed Oct. 1, 1979, Ser. No. 80,304
Claims priority, application Sweden, Oct. 2, 1978, 7810289
Int. Cl.³ B01D *35/06*
U.S. Cl. 210—223 5 Claims

1. Magnetic fuel purifier with rotating pre-purifier for liquid fuel and the like with separation of contaminations, partly by centrifugalizing and partly by magnetic action, comprising a conical pre-purifier (46); a tubular, non-magnetic center shaft (42) for supporting the pre-purifier, the center shaft being an inlet for the fuel and having a plurality of through-going ducts

(44) for the passage of fuel, said pre-purifier having pitching longitudinal wing blades (48) rotated by the fuel pressure, whereby the fuel is thrown against conical outer walls of the pre-purifier and thereafter falls downwards; a conical magnet (40) surrounding and firmly applied to the center shaft below the pre-purifier in such manner that the falling fuel strikes the magnet; a collecting container (34) positioned below the magnet; a conical filter (50) surrounding the pre-purifier in such manner that fuel flows from the collecting container through the conical filter out of the purifier, the conical filter being made from sintered bronze ball material; an outer case (22) for holding the pre-purifier, conical magnet, and conical filter and for forming the collecting container; and a lid (24) connected to the outer case, the outer case and lid being made from non-magnetic, transparent material; said blades (48) of said



pre-purifier (46) extending inwardly from the outer walls towards the center shaft (42), said pre-purifier (46) having a closed top with a portion of its upper surface shaped to mate with a portion of the conical filter (50) to thereby center said pre-purifier (46) in said outer case (22), said outer case (22) having a through duct (30) formed in a lower portion thereof communicating with the interior of said center shaft (42) for introducing fuel into said purifier, and said lid (24) having a through duct (32) for passage of purified fuel out of said purifier, said outer walls of said pre-purifier (46) being spaced from and at least partially encompassed by said conical filter (50) so that a fluid flow path is defined therebetween, fuel flowing upwardly from said collecting container (34) into said fluid flow path and through said conical filter (50) into said duct (32) of said lid (24).

4,295,970

FILTER CONVEYING DEVICE FOR FILTER PRESSES

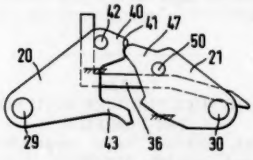
Max Oelbermann, Remscheid, and Karl-August Rademacher, Wuppertal, both of Fed. Rep. of Germany, assignors to Rittershaus & Blecher GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jun. 6, 1980, Ser. No. 157,154

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923864

Int. Cl.³ B01D *25/00*

U.S. Cl. 210—230 **15 Claims**



1. A device for conveying respective filter plates from a filter plate pack of a filter press, the device including a carriage means adapted to move along the filter press, drive means for selectively moving the carriage means in a forward and reverse direction, means for automatically reversing a direction of the carriage means upon the carriage means encountering a predetermined resistance to movement, characterized in that a pawl means is swingably mounted on the carriage means for engaging behind a foremost filter plate of the filter plate pack during a movement of the carriage means in a first direction of movement, a drop lever means is swingably mounted on the carriage means for engaging a forward portion of the foremost filter plate during a movement of the carriage means in a direction opposite said first direction of movement, said pawl means and said drop lever means being configured such that when they are swung upward into a stop position out of contact with the filter plates they cooperate with one another to hold themselves in said stop position whereby they may travel past the filter plates without contacting said filter plates, and wherein means are provided at a first end of the filter press for swinging the pawl means and drop lever means into the upward stop position so as to enable the pawl means and drop lever means to travel past the filter plates without contact, and in that means are provided on an opposite end of the filter press for swinging the pawl means into a release position so as to release the drop lever means from the stop position.

4,295,971

METHOD FOR CLARIFYING SLIMES

Sanaa E. Khalafalla, Minneapolis, and George W. Reimers, Burnsville, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 14, 1980, Ser. No. 177,975

Int. Cl.³ C02B *9/02*

U.S. Cl. 210—695 **11 Claims**

1. A method for clarifying slimes from the group consisting of iron oxide slimes, oxidized taconite slimes, scrubber water from iron-making furnaces, and kaolin slimes, said method comprising the steps of

(a) treating the slime with a stabilized aqueous-base magnetic colloid comprising (1) colloidal magnetic particles and (2) at least one surfactant that bridges the slime particles electrostatically to said magnetic particles and that stabilizes said magnetic particles, said surfactant being present in an amount sufficient to perform the bridging and stabilization functions; said magnetic colloid becoming unstable and said magnetic particles thereof irreversibly flocculating when said magnetic colloid is sufficiently diluted, and said magnetic colloid being used in an amount sufficient to provide for particle-to-particle titration between said slime particles and said magnetic particles,

whereby said magnetic particles form floccules with said slime particles; and

(b) separating the clarified slime from the aggregated floccules.

4,295,972

METHOD FOR TREATING WATER CONTAINING WASTES

Takeji Kamei, Fuji, Japan, assignor to Nihon Automatic Machinery Mfg. Co., Ltd., Japan

Division of Ser. No. 35,201, Apr. 30, 1979, Pat. No. 4,226,712. This application May 7, 1980, Ser. No. 147,381

Claims priority, application Japan, Apr. 28, 1978, 53-51916; Apr. 29, 1978, 53-51195

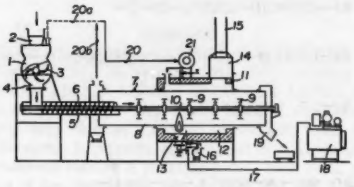
The portion of the term of this patent subsequent to Oct. 7, 1997, has been disclaimed.

Int. Cl.³ C02F *11/14*

U.S. Cl. 210—710 **1 Claim**

1. A method of treating water containing organic waste comprising the steps of: mixing 100 parts by weight of the organic waste containing 50% to 99.8% by weight of water with from 5 to 40 parts by weight of calcium oxide to produce an exothermic reaction mixture of the calcium oxide and the water containing the waste; heating the reaction mixture using the heat from the exothermic reaction mixture to obtain a preliminary dried mixture; transferring the preliminarily dried mixture to a drying kiln; further drying the preliminarily dried mixture and granulating it in the drying kiln by continuously agitating and heating the preliminarily dried mixture to a temperature of between 100° C. and 300° C. to yield a granulated

product, collecting stinking exhaust gases produced by said mixing of the waste with calcium oxide; channeling the exhaust



gases to a furnace; and burning the exhaust gases in the furnace to produce substantially odorless gases.

4,295,973

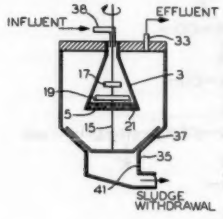
PROCESS FOR SEPARATING SOLIDS FROM SUSPENSIONS OF INFLUENT

Kamlesh K. Jain, Phoenixville, Pa., assignor to Fram Industrial Filter Corp., Tulsa, Okla.

Division of Ser. No. 21,276, Mar. 16, 1979, Pat. No. 4,224,157. This application Apr. 28, 1980, Ser. No. 144,721

Int. Cl.³ C02F *1/52*

U.S. Cl. 210—738 **3 Claims**



1. A process for separating solids from suspensions wherein influent is mixed in an inner mixing compartment of a separator unit, and wherein said influent is transferred to an outer settling compartment from which clarified liquids and settled suspensions are withdrawn, wherein the improvement comprises separating said mixing compartment from said settling compartment with a hydrodynamic changing means, minimizing convective momentum of said influent with said hydrodynamic changing means while transferring said influent from said mixing compartment to said settling compartment, by which said agglomerated solids are prevented from breaking up and are caused to settle without interference from said influent, and continuously decreasing said momentum of said influent flowing through said mixing and settling compartments to cause said solids of increasingly smaller sizes to separate and settle, said step of minimizing said momentum further comprising directing said influent through perforations in said plate which perforations are orientated to eliminate or minimize tangential components of velocity and minimize axial components of said velocity, by which said momentum in said settling compartment is minimized, whereby to maximize a rate of said settling.

4,295,974

BLOOD SAMPLE COLLECTION AND PHASE SEPARATION DEVICE

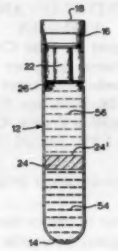
William D. Cornell, Ballwin, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed May 5, 1980, Ser. No. 146,845

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—789 **19 Claims**

19. The method of collecting a sample of whole blood, and separating and partitioning it into its relatively high and low density phases comprising the steps of providing an evacuated container having a closed bottom end and an open upper end, a phase partitioning device in the container near the upper end of the container which has a main portion spaced from the inner sidewall of the container, a quantity of thixotropic gel-like blood phase partitioning material in an initial location between and in contact with said main portion and inner sidewall of the container, restricted orifice means communicating between the gel-like material and the interior of the container below the partitioning device, and a stopper in the open end of



the container, introducing a sample of whole blood into the interior of the container by piercing the stopper with a needle cannula connected to a source of whole blood, centrifuging the container to centrifugally separate the whole blood sample into its low and high density phases, and moving the gel-like material from its initial location through said restricted orifice means and into the interior of the container below the partitioning device under the influence of centrifugal forces during centrifugation at a flow rate requiring that the barrier formed by the gel-like material takes at least 1 minute to become completely formed.

4,295,975

OIL COLLECTING METHOD

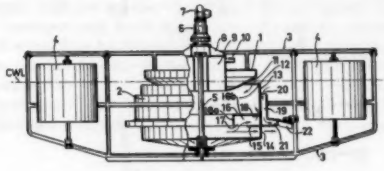
Gösta Walin, L. Montörsgatan 3, Västra Frölunda, Sweden S-421 68

Division of Ser. No. 898,079, Apr. 20, 1978, Pat. No. 4,186,095. This application Jan. 29, 1980, Ser. No. 116,647

Claims priority, application Sweden, Apr. 27, 1977, 7704814

Int. Cl.³ E02B *15/04*

U.S. Cl. 210—800 **8 Claims**



1. A method of separating and collecting oil floating on the surface of a body of oil-polluted water comprising the steps of:

fixedly positioning a stator on the water, said stator being substantially symmetrical about a generally vertical axis and having a downwardly opening central oil-collecting cavity, and a lower oil-contacting and diverting surface which slopes downwardly and inwardly from the periphery of said stator through the surface of the water to the submerged opening of said cavity;

rotating a submerged hollow rotor about said vertical axis directly beneath said stator, the rotor having a sidewall defining therewithin a rotor interior, the interior of said rotor communicating with the surrounding body of water through an upper inlet near the surface of the water which

surrounds the lower surface of said stator, and a lower outlet spaced below said inlet in the lower portion of said rotor, said rotation establishing a vortex of liquid in the interior of said rotor which draws a surface layer of oil and water into the upper portion of said rotor through said outlet, and causes the rotating oil to contact the lower surface of said stator to be slowed thereby and diverted inward to said oil-collecting cavity.

4,295,976

FLUORINATED ANTI-STAIN AND SOIL RELEASE FINISHES

Andre L. Dessaint, Nogent sur Oise Creil, and Jean Perronin, Chantilly, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Sep. 28, 1976, Ser. No. 727,497

Claims priority, application France, Oct. 17, 1975, 75 31794

Int. Cl.[3] **C14C** *9/00;* **C07C** *149/20, 149/40;* **C09K** *15/10*

U.S. Cl. 252—8.9 **32 Claims**

1. A fluorinated telomerization product consisting of the reaction product of:

(a) one mole of an ester of one or more polyols with one or more acids of the general formula:

$$HS—A(COOH)_n \qquad (I)$$

wherein A represents an aliphatic or cyclic hydrocarbon radical and n is a whole number from 1 to 4, and

(b) 1 to 5 moles of one or more compounds possessing at least one ethylene bond, at least one of these compounds corresponding to the general formula:

$$Rf—B—\underset{\displaystyle R}{\underset{|}{C}}=CH—R \qquad (II)$$

wherein Rf represents a perfluorinated chain, straight or branched, containing 1 to 20 carbon atoms,

one of the sybmols R is hydrogen and the other is hydrogen or alkyl containing 1 to 4 carbon atoms; and

Rf—B—is a residue selected from the group consisting of the residues of following formulae:

$$Rf—(CH_2)_x—SO_2—\underset{\displaystyle R'}{\underset{|}{N}}—(CXX')_y—\underset{\displaystyle R'''}{\underset{|}{C}}—O—\overset{\displaystyle O}{\overset{\|}{C}}—\quad \overset{\displaystyle R''}{}$$

$$Rf—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—(CXX')_x—(OC_2H_2XX')_z—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—(CXX')_x—O—(CXX')_y—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—(CXX')_x—S—(CXX')_y—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—(CXX')_x—S—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—(CXX')_x—SO_2—(CXX')_y—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—SO_2—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—CH=CH—CH_2—(OC_2H_2XX')_z—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

-continued

$$Rf—CH=CH—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—CF=CH—CH=CH—(OC_2H_2XX')_z—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—SO_2—\underset{\displaystyle R'}{\underset{|}{N}}—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—SO_2—\underset{\displaystyle R'}{\underset{|}{N}}—(CXX')_x—\underset{\displaystyle R'''}{\underset{|}{C}}—O—\overset{\displaystyle O}{\overset{\|}{C}}—\quad \overset{\displaystyle R''}{}$$

$$Rf—CO_2—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—CO—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—CO—\underset{\displaystyle R'}{\underset{|}{N}}—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$$

$$Rf—SO_2—(CXX')_x—$$

$$Rf—O—$$

$$Rf—CO_2—(CXX')_x—$$

$$Rf—(CH_2)_x—\underset{\displaystyle R'}{\underset{|}{N}}—CO—$$

$$Rf—SO_2—\underset{\displaystyle R'}{\underset{|}{N}}—CO—$$

$$Rf—CO—\underset{\displaystyle R'}{\underset{|}{N}}—CO—$$

$$Rf—CO—\underset{\displaystyle R'}{\underset{|}{N}}—(CXX')_x—\underset{\displaystyle R''}{\underset{|}{N}}—CO— \quad \text{and}$$

$$Rf—CO—\underset{\displaystyle R'}{\underset{|}{N}}—$$

wherein

x is a whole number between 1 and 20;

y is a whole number from 1 to 4;

z is a whole number from 1 to 10;

R′ is hydrogen, alkyl with 1 to 10 carbon atoms, cycloalkyl with 5 to 12 carbon atoms or hydroxyalkyl with 2 to 4 carbon atoms;

R″, R‴, X and X′ are the same or different and each represents hydrogen or alkyl with 1 to 4 carbon atoms.

12. A composition for treating a textile to render said textile resistant to soiling comprising an effective amount of a fluorinated product as defined in claim **1** in a solvent medium.

4,295,977

NONIONIC TEXTILE SOFTENER COMPOSITION

Edwin C. Sherburne, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 123,874, Feb. 22, 1980, abandoned. This application May 12, 1980, Ser. No. 148,063

Int. Cl.[3] **D06M** *13/02, 13/18*

U.S. Cl. 252—8.9 **10 Claims**

1. A nonionic textile softening composition comprising:

(1) from about 70% to about 80% by weight of a blend of (i) a mixture of linear and branched C_{18} to C_{32} monohydric alcohols and (ii) a mixture of C_{24} to C_{40} hydrocarbons, said blend of alcohols and hydrocarbons having a melting point between 110° F. and about 122° F.;

(2) from about 15% to about 25% by weight of the etherification reaction product of ethylene oxide and blend (1) where from about 30 to about 50 mols of ethylene oxide are reacted with each mol of hydroxyl groups in blend (1); and

(3) from about 3% to about 10% by weight of polyoxyethylene

ether of oxo decyl alcohol wherein the mol ratio of oxyethylene groups to oxo decyl alcohol groups is from about 5 to about 10.

4,295,978

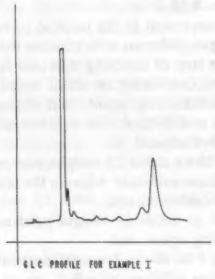
USE OF ISOCHROMAN MUSK COMPOUNDS IN AUGMENTING OR ENHANCING THE AROMA OF DRYER-ADDED FABRIC SOFTENER ARTICLES

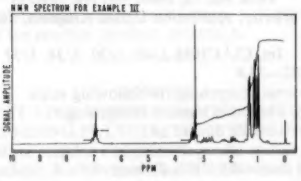
Wilhelmus J. Wiegers, Red Bank; Mark A. Sprecker, Sea Bright; Hugh Watkins, Lincroft; Manfred H. Vock, Locust, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

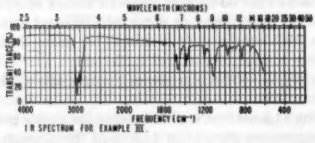
Division of Ser. No. 63,374, Aug. 3, 1979, Pat. No. 4,250,200. This application Nov. 13, 1980, Ser. No. 206,651

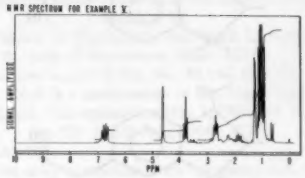
Int. Cl.[3] **D06M** *13/18, 13/16, 15/00*

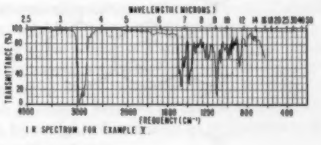
U.S. Cl. 252—8.9 **3 Claims**



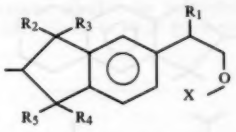




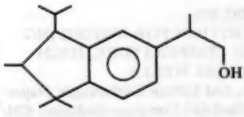


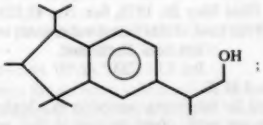


1. A dryer-added fabric softening article comprising a substrate, a substrate coating, and an outer coating, said outer coating coated on said substrate coating and said substrate coating coated on said substrate, said substrate comprising a water dissolvable paper and said outer coating comprising from 0.05% up to 5% by weight of said dryer-added fabric softener article of an indane alkanol or tricyclic isochroman having the structure:



wherein X is hydrogen, methyl or —CH_2—; the dashed line is either a carbon-carbon single bond or no bond; R_1 is hydrogen or methyl; R_2, R_3, R_4 and R_5 represent hydrogen, methyl or isopropyl; with the proviso that R_2 and R_3 are methyl when R_4 is hydrogen and R_5 is isopropyl or R_4 and R_5 represent methyl when R_2 is hydrogen and R_3 is isopropyl; and with the further proviso that the dashed line is a carbon-carbon single bond when X is —CH_2— and the dashed line is no bond when X is hydrogen or CH_3, said indane alkanol or tricyclic isochroman having a structure selected from the group consisting of:





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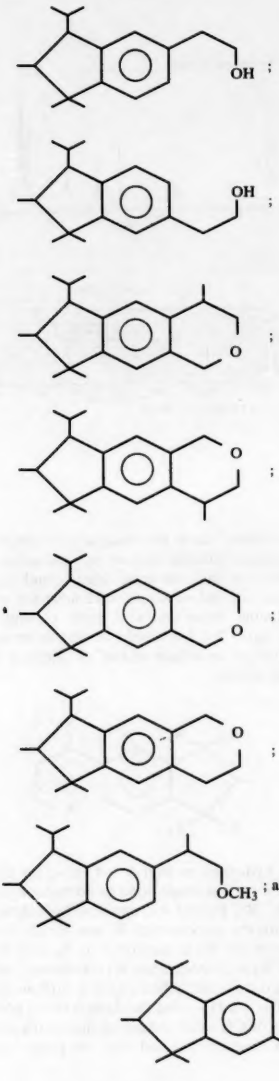


4,295,979

METHOD AND COMPOSITION FOR INHIBITING CORROSION IN HIGH TEMPERATURE, HIGH PRESSURE GAS WELLS

Shelby P. Sharp, Tulsa, Okla., and Lyman Yarborough, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 29, 1979, Ser. No. 43,521

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.[3] **C23F** *11/00*

U.S. Cl. 252—8.55 E **5 Claims**

1. A method for inhibiting corrosion in a high temperature, high pressure gas well, characterized in that an aqueous or brine phase is present, but no petroleum condensate phase exists at bottomhole conditions, comprising the steps of:

(a) adding up to about 27 parts by weight of an alkyl amine per 100 parts per weight of a dialkyl disulfide producing an amine activated dialkyl disulfide solvent.

(b) adding to said activated dialkyl disulfide solvent at least about 40 parts by weight by elemental sulfur per 100 parts by weight alkyl disulfide oil producing a corrosion inhibitor carrier capable of existing in a liquid phase at bottomhole conditions at said high temperature, high pressure gas well,

(c) injecting said corrosion inhibitor carrier into said gas well to inhibit corrosion.

4,295,980

WATERFLOOD METHOD

Kaye L. Motz, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 910,243, May 30, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,642

Int. Cl.[3] **E21B** *43/22*

U.S. Cl. 252—8.55 D **13 Claims**

1. An improvement in the method of recovering hydrocarbons from a petroliferous subterranean formation, said method including the step of injecting into said formation an aqueous saline mixture containing an alkali metal hydrocarbon sulfonate and a solubilizing agent, said improvement comprising injecting into said formation an aqueous saline mixture containing an effective amount of

(a) about 0.5 to about 25 weight percent of an alkali metal linear alkane sulfonate wherein the alkane moiety contains 20 to 24 carbon atoms,

(b) about 1 to about 25 weight percent of a water-soluble solubilizing agent, and

(c) about 0.5 to about 3 weight percent of a salinity agent which is an alkali metal salt,

said method being characterized further in that the water-soluble solubilizing agent is a water-soluble C_1–C_5 alcohol.

4,295,981

PRODUCTION OF OVERBASED MAGNESIUM DETERGENT ADDITIVES

Victor C. Burnop, Church Croft, West Challow, Wantage, Oxfordshire, England

Filed Jul. 21, 1980, Ser. No. 169,513

Claims priority, application United Kingdom, Jul. 27, 1979, 26211/79

Int. Cl.[3] **C10M** *1/40, 1/20, 3/34, 3/14*

U.S. Cl. 252—33.4 **7 Claims**

1. A process comprising the following steps:

(i) forming a reaction mixture comprising:

(a) a non-volatile diluent oil

(b) magnesium alkoxyalkoxide as a solution in the alkoxyalcohol from which it is derived

(c) one or more hydrocarbyl-substituted phenols or metal phenates wherein the or each hydrocarbyl group contains no more than 60 carbon atoms or one or more sulphurised phenols having one or more hydrocarbyl group substituents each substituent containing no more than 60 carbon atoms or mixtures of said surfactants

(ii) adjusting the concentration of the free alkoxyalcohol to be less than 5%

(iii) adding at least one mole of water for every gram atom of the magnesium present in excess of the amount of magnesium required to neutralise the surfactant and hydrolysing the magnesium alkoxyalkoxide

(iv) introducing carbon dioxide into the reaction mixture whilst at a temperature not above 100° C.

(v) removing volatiles from the reaction mixture.

3. A process according to claim **1** in which sulphonate or a sulphonic acid is included in the reaction mixture.

4,295,982

SULFURIZED AMINOGUANIDINE REACTION PRODUCT AND LUBRICANT COMPOSITIONS CONTAINING SAME

Gerassimos Frangatos, Haddonfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 12, 1980, Ser. No. 148,898
Int. Cl.[3] C10M *1/38*
U.S. Cl. 252—42 10 Claims

1. A product obtained by (1) reacting an aminoguanidine or an acid salt thereof with an unsaturated monocarboxylic acid at a temperature of from about 150° C. to about 275° C. and (2) reacting the product of (1) with sulfur at from about 150° C. to about 225° C.

5. A lubricant composition comprising a major proportion of a mineral lubricating oil, a synthetic lubricating oil or a grease from either of these and an anti-rust amount of the product of claim 1.

9. The composition of claim 5 wherein the lubricant is a grease.

10. The composition of claim 9 wherein the thickener for said grease is a lithium hydroxystearate soap.

4,295,983

LUBRICATING OIL COMPOSITION CONTAINING BORONATED N-HYDROXYMETHYL SUCCINIMIDE FRICTION REDUCERS

Andrew G. Papay, Manchester, and Joseph P. O'Brien, Kirkwood, both of Mo., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 12, 1980, Ser. No. 158,715
Int. Cl.[3] C10M *1/10*
U.S. Cl. 252—49.6 16 Claims

1. A friction reducing lubricating oil additive comprising the reaction product of an N-hydroxymethyl aliphatic hydrocarbyl succinimide with an amount of a boronating agent sufficient to impart about 0.1 to 1.5 weight percent boron to said reaction product, said reaction product being made at about 50°–200° C., said N-hydroxymethyl aliphatic hydrocarbyl succinimide prepared by reacting NH_3 with an aliphatic C_{12}–C_{36} hydrocarbyl succinic anhydride to form the corresponding succinimide and subsequently reacting the succinimide with formaldehyde to form said N-hydroxymethyl aliphatic hydrocarbyl succinimide.

9. Lubricating oil formulated for use in the crankcase of an internal combustion engine containing a friction-reducing amount of the reaction product of claim 1.

4,295,984

PASTE-LIKE, VISCOUS DAMPING MEDIUM COMPRISING POLYGLYCOL ETHERS AND/OR ESTERS

Kaspar Lochner, Karlsburgstr. 7b, 8000 München, Fed. Rep. of Germany

Filed Oct. 3, 1979, Ser. No. 81,381
The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.
Int. Cl.[3] C04B *43/00*
U.S. Cl. 252—62 24 Claims

1. A paste-like, viscous damping medium dispersion for damping mechanical and acoustic vibrations, comprising polyglycol ethers and/or polyglycol esters having a viscosity of about 10 cSt to 1000 cSt at 50° C. and a relative average molecular weight of about 700 to 20000, 30 to 70% by weight of ground graphite having a particle size of less than 100μ, 0.1 to 8% by weight of a wetting agent and 0.1 to 10% by weight of finely ground aluminum silicate or amorphous silicon dioxide as a viscosity stabilizer, the % weight being based in each case on the total weight of the dispersion, the viscosity of the dispersion being about (1 to 4)$\times 10^6$ cP at 25° C.

4,295,985

METHOD OF REMOVAL OF CHLORINE RETAINED BY HUMAN SKIN AND HAIR AFTER EXPOSURE TO CHLORINATED WATER, AND SOAP AND SHAMPOO COMPOSITIONS ADAPTED TO EFFECT SAID REMOVAL

Henry G. Petrow, 32 Garfield St., and Mark L. Weissman, 742 Belmont St., both of Watertown, Mass. 02172

Continuation-in-part of Ser. No. 88,144, Oct. 25, 1979, abandoned, which is a continuation of Ser. No. 900,601, Jun. 7, 1978, abandoned. This application May 1, 1980, Ser. No. 145,681
Int. Cl.[3] C11D *7/32;* D06L *3/10*
U.S. Cl. 252—105 10 Claims

1. A toilet soap composition for cleansing and removing retained chlorine from human skin and hair after immersion in chlorine containing waters, said composition consisting essentially of a chemically stable, uniform mixture of a toilet soap and a water soluble, non-toxic and harmless-to-the skin chlorine-reducing agent which is a mixture of from about 50 to about 30% by weight urea and from about 50 to about 70% by weight of an alkali metal thiosulfate, said agent being present in said mixture in amount between at least about 2% and less than about 15% by weight of said soap in said mixture and being compatible with said soap.

4,295,986

LOW TEMPERATURE CATALYTIC REDUCTION

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Filed May 14, 1979, Ser. No. 38,898
Int. Cl.[3] C07B *1/00;* C09K *3/00*
U.S. Cl. 252—188 15 Claims

1. A process for reducing compounds having reducible electronegative functionality, said process comprising the step of carrying out said reduction in a reaction medium which comprises a reducing agent which is a hydride of an alkali metal, and a catalyst which is the borohydride of an alkali metal, and an ether solvent in which the borohydride catalyst is soluble.

4,295,987

CROSS-LINKED SODIUM POLYACRYLATE ABSORBENT

Lawrence R. Parks, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 26, 1979, Ser. No. 106,958
Int. Cl.[3] B01J *20/04;* D21D *3/00;* B01J *20/10, 20/26*
U.S. Cl. 252—194 18 Claims

1. An absorbent composition comprising a copolymer of acrylic acid cross-linked with a first cross-linking component comprising a monomer having at least two vinyl groups and a second cross-linking component comprising an ionic divalent cation.

4,295,988

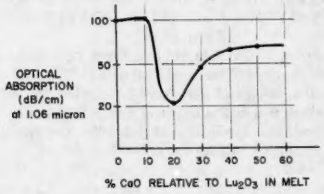
MAGNETO-OPTIC BI_1 LU_2 FE_5O_{12} CRYSTALS

Gary L. Nelson, Eagan, and William A. Harvey, Minneapolis, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 18, 1979, Ser. No. 58,710
Int. Cl.[3] C30B *29/28*
U.S. Cl. 252—584 2 Claims

1. A mixture for growing a $Bi_1Lu_2Fe_5O_{12}$ garnet crystal on a $Gd_3Ga_5O_{12}$ garnet substrate in a liquid phase eptiaxial process, said mixture consisting essentially of PbO, Bi_2O_3, Fe_2O_3,

Lu_2O_3 and CaO in concentrations sufficient to grow said Bi_1-$Lu_2Fe_5O_{12}$ garnet crystal and the latter CaO in a concentration



such that the molar ratio of CaO to Lu_2O_3 is in the range of 0.05 to 0.40.

4,295,989

LUMINESCENT HAFNIA COMPOSITION

Philipp H. Klein, Washington, D.C.; Arrigo Addamiano, and Roger Allen, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1980, Ser. No. 162,347

Int. Cl.³ C09K *11/463*

U.S. Cl. 252—301.4 F **11 Claims**

1. A blue-luminescing material of $3HfO_2{:}Y_2O_3$ with a Ce^{3+} dopant in an amount of 0.1 to 1.0 weight percent exhibiting a cubic crystalline structure.

4,295,990

REAGENT FOR THE QUANTITATIVE DETERMINATION OF WATER

Antonie E. Verbeek, and Jozef M. J. Mattheij, both of Deventer, Netherlands, assignors to J. T. Baker Chemicals B.V., Deventer, Netherlands

Filed Jun. 9, 1980, Ser. No. 157,440

Claims priority, application European Pat. Off., Jul. 26, 1979, 79102673.5

Int. Cl.³ G01N *31/00*; C09K *3/00*

U.S. Cl. 252—408 **6 Claims**

1. A reagent for the quantitative determination of water in combination with a titration solution containing iodine, which reagent contains sulfur dioxide and an anhydrous alkali metal acetate in an anhydrous lower aliphatic alcohol as solvent, characterized in that the lower aliphatic alcohol is selected from the group consisting of 2-methoxy ethanol or a mixture of 2-methoxy ethanol and methanol in a volume ratio of at least 10:90.

4,295,991

TITANIUM TRICHLORIDE CATALYST COMPONENT AND THE PROCESS FOR THE PRODUCTION THEREOF

Harry J. Wristers, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 26, 1978, Ser. No. 945,929

Int. Cl.² C08F *4/64*

U.S. Cl. 252—429 B **47 Claims**

1. A non-friable, highly active Ziegler-type $TiCl_3$ catalyst composition obtained by:

(1) contacting $TiCl_4$ with an organoaluminum compound at a temperature in the range of about −50° C. to about 30° C. to produce a $TiCl_3$ reduced solid product,

(2) contacting the reduced solid $TiCl_3$ product with a minor amount of an α-olefin having at least three carbon atoms under polymerization conditions to obtain a reduced $TiCl_3$ solid product containing about 1 to about 1,000 wt.% of prepolymerized α-olefin based on the weight of $TiCl_3$,

(3) treating said prepolymerized reduced solid with one of (a) a chlorinated hydrocarbon having at least 2 carbon atoms and a Lewis base complexing agent or (b) $TiCl_4$ and a Lewis base complexing agent to convert the prepolymerized $TiCl_3$ reduced solid to a substantially non-friable highly active, crystalline prepolymerized $TiCl_3$ composition.

4,295,992

SUPPORT PREPARED FROM ORGANOMAGNESIUM COMPOUNDS AND SILICON HALIDES; AND CATALYSTS FOR POLYMERIZING OLEFINS

Ronald L. Gibbs, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 102,808, Dec. 12, 1979, abandoned, which is a continuation of Ser. No. 24,487, Mar. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 920,769, Jun. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 837,665, Sep. 29, 1977, abandoned. This application Jun. 17, 1980, Ser. No. 160,332

Int. Cl.³ C08F *4/02, 4/64, 10/02, 10/06*

U.S. Cl. 252—429 C **30 Claims**

1. A catalyst support which comprises the reaction product formed by reacting (1) a mixture of an organomagnesium compound represented by the formula MgR_2 and a silicon halide represented by the formula $R'_{4-n}SiX_n$, said mixture being in a non-polar solvent, with (2) an alcohol represented by the formula R″OH; wherein the organomagnesium compound is or can be rendered hydrocarbon soluble and wherein each R, R′ and R″ is independently an aliphatic hydrocarbon group having from 1 to about 20 carbon atoms, X is Cl, Br or I, n has a value of from 1 to 4 and wherein the molar ratio of $R''OH{:}MgR_2$ is at least 2:1 and the molar ratio of $R''OH{:}R'_{4-n}SiX_n$ is sufficient so as to provide at least one X group per OH group.

2. The catalyst support of claim 1 wherein R has from about 2 to about 8 carbon atoms, R′ has from about 1 to about 6 carbon atoms, R″ is an aliphatic group having from about 1 to about 6 carbon atoms, X is chlorine or bromine; wherein the ratio of $R''OH{:}R'_{4-n}SiX_n$ is sufficient so as to provide from 2 to about 3 X groups per OH group; and wherein said non-polar solvent has a hydrocarbon having from about 5 to about 10 carbon atoms.

9. A catalyst composition resulting from the addition of a reducing agent to a mixture of the support of claims 1, 2 or 3 suspended in an inert liquid hydrocarbon and a transition metal compound of Groups 4b, 5b, 6b, 7b, or 8 of Mendeleev's Periodic Table under conditions so as to produce a catalytically active product and in proportions such that the magnesium: transition metal atomic ratio is from about 0.1:1 to about 30:1 followed by washing the resultant solid catalyst product with an inert liquid hydrocarbon.

4,295,993

CATALYTIC COMPOSITE, METHOD OF MANUFACTURE AND PROCESS FOR USE

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

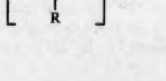
Filed Jan. 4, 1980, Ser. No. 109,934

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.³ B01J *31/22*

U.S. Cl. 252—430 **24 Claims**

1. A catalytic composite comprising a metal chelate, an alkali metal hydroxide, and a quaternary ammonium hydroxide disposed on a molecular sieve support, the quaternary ammonium hydroxide represented by the structural formula:



wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, and R′ is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, said alkali metal hydroxide comprising at least about 10 wt. % of said catalytic composite.

4,295,994

CELLULOSE ACETATE BUTYRATE BOUND ZEOLITE ADSORBENTS

Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 48,955, Jun. 15, 1979, Pat. No. 4,248,737. This application Apr. 11, 1980, Ser. No. 139,492

Int. Cl.³ B01J *29/08, 20/18*

U.S. Cl. 252—430 **14 Claims**

1. An adsorbent comprising a zeolite crystalline aluminosilicate suitable for use in a process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components by contacting said solution with said adsorbent, the silicon constituent of said adsorbent tending to dissolve in said solution resulting in the undesirable disintegration of said crystalline aluminosilicate, the adsorbent additionally containing a water permeable binder material comprising cellulose acetate butyrate which substantially reduces the extent of dissolution of said silicon constituent and the extent of said disintegration of said adsorbent.

3. The adsorbent of claim **2** further characterized in that said crystalline aluminosilicate contains cations at exchangeable cationic sites selected from the group consisting of alkali metals and alkali earth metals.

4,295,995

CATALYSTS HYDROCARBON TREATING PROCESSES

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 955,526, Oct. 30, 1978, which is a continuation-in-part of Ser. No. 847,898, Nov. 2, 1977, Pat. No. 4,134,825. This application Nov. 1, 1979, Ser. No. 90,415

Int. Cl.³ B01J *23/84, 23/85, 27/04, 31/12*

U.S. Cl. 252—431 C **20 Claims**

1. A catalyst comprising a composition comprising a metal component, carbon and hydrogen deposited on a support selected from the group consisting of solid metals and metal alloys of metals of Groups IB, II, III, IV, VB, VIB, VIIB, VIII and mixtures thereof of the Periodic Table of Elements, said support having a surface area of less than about 5 square meters per gram, and the metal constituent of said metal component of said composition being selected from the group consisting of metals of Groups II, III, IV, V, VIB, VIIB, VIII and mixtures thereof of the Periodic Table of Elements, said composition having a surface area of at least about 50 m^2/g, said catalyst having been prepared by the steps which comprise:

(a) dispersing in a hydrocarbon oil having a Conradson carbon content up to about 50 weight percent, (1) a thermally decomposable metal compound in an amount sufficient to provide a ratio of atoms of oil Conradson carbon to atom of metal constituent of said thermally decomposable compound of less than about 750 to 1, said metal constituent being selected from the group consisting of Group II, Group III, Group IV, Group V, Group VIB, Group VIIB, and Group VIII of the Periodic Table of Elements and mixtures thereof, and (2) said support;

(b) heating the resulting mixture in the presence of a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas and a gas comprising hydrogen and hydrogen sulfide, and

(c) recovering a supported catalyst.

4,295,996

CATALYSTS FOR HYDROCARBON TREATING PROCESSES

Roby Bearden, Jr.; Clyde L. Aldridge, and Lloyd A. Pine, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 13, 1979, Ser. No. 93,698

Int. Cl.³ B01J *23/74, 27/04, 31/12*

U.S. Cl. 252—431 C **21 Claims**

1. A catalyst comprising a composition comprising a metal component, carbon and hydrogen deposited on a support, the metal constituent of said metal component of said composition being selected from the group consisting of metals of Groups II, III, IV, V, VIB, VIIB, VIII and mixtures thereof of the Periodic Table of Elements, said composition having a surface area of at least about 50 m^2/g and said support being an aluminum alloy powder having a surface area of less than 5 square meters per gram, said alloy having been prepared by atomizing said aluminum alloy, in molten state, into a stream selected from the group consisting of water, a gas and mixtures thereof, said catalyst having been prepared by the steps which comprise:

(a) dispersing in a hydrocarbon oil having a Conradson carbon content up to about 50 weight percent, (1) a thermally decomposable metal compound in an amount sufficient to provide a ratio of atoms of oil Conradson carbon to atom of metal constituent of said thermally decomposable metal compound of less than about 750 to 1, said metal constituent being selected from the group consisting of Group II, Group III, Group IV, Group V, Group VIB, Group VIIB, and Group VIII of the Periodic Table of Elements and mixtures thereof, and (2) said support;

(b) heating the resulting mixture in the presence of a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas and a gas comprising hydrogen and hydrogen sulfide, and

(c) recovering a supported catalyst.

4,295,997

SO_2 ACTIVATION OF SUPPORTED CHROMIUM OXIDE CATALYSTS

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 2,633, Jan. 11, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,435

Int. Cl.³ B01J *27/02, 23/26, 21/08*

U.S. Cl. 252—439 **8 Claims**

1. A method for producing an activated catalyst said method comprising:

(1) contacting a catalyst comprising chromium on a silica-containing support with a gaseous environment consisting essentially of sulfur dioxide and oxygen at a temperature within a temperature range and for a time sufficient to activate the catalyst and subsequently

(2) maintaining a temperature within the contact temperature range of step (1) while contacting said catalyst with a gaseous environment consisting essentially of oxygen and gases inert to reaction with the catalyst.

2. A method of claim **1** wherein the catalyst is contacted

with a gaseous environment consisting essentially of oxygen and gases inert to reaction with the catalyst while the temperature is being increased prior to contact with sulfur dioxide.

4,295,998

SELENIUM OR TELLURIUM TREATED SILICA

Gil R. Hawley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1980, Ser. No. 130,632
Int. Cl.[3] B01J *21/06, 27/00*
U.S. Cl. 252—439 **16 Claims**

1. A process comprising a first step wherein silica is contacted with a treating agent selected from at least one of selenium or tellurium under nonoxidizing conditions at a temperature of at least 370° C. and a subsequent second step wherein it is contacted with an oxidizing ambient at a temperature within the range of 370°–900° C.

2. A method according to claim **1** for producing a catalyst wherein said silica contains a chromium compound and is heated in the presence of oxygen prior to said treatment with said selenium or tellurium, said selenium or tellurium being in elemental form and being used in an amount within the range of 0.05 to 1 weight percent of the element based on the weight of the oxidized catalyst and wherein said oxidizing ambient comprises oxygen.

4,295,999

POLYMERIZATION CATALYST

Lynn H. Slaugh, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 86,013, Oct. 17, 1979, Pat. No. 4,239,872. This application May 21, 1980, Ser. No. 152,209
Int. Cl.[3] B01J *23/20, 23/24, 21/00*
U.S. Cl. 252—455 R **16 Claims**

1. A process for the preparation of a catalyst suitable for polymerization reactions which process comprises:

(a) impregnating a silica or alumina support with a transition metal salt decomposable upon calcination to the oxide wherein said metal salt is selected from the group consisting of vanadium, titanium, chromium or mixtures thereof;

(b) calcining the metal impregnated support at a temperature ranging from about 450° C. to about 1000° C.;

(c) impregnating the calcined support with a solution of aluminum hydride; and

(d) heating the hydride impregnated support in hydrogen at a temperature range from about 200° C. to about 600° C.

4. The process of claims **1**, **2** or **3** wherein the support is silica.

7. The process of claims **1**, **2** or **3** wherein the transition metal ranges from about 0.1 to about 20 percent by weight (measured as the metal) of the total catalyst and the aluminum added as aluminum hydride ranges from about 0.1 to about 25 percent by weight (measured as the metal) of the total catalyst.

4,296,000

ADSORBENTS FOR POLYOL PURIFICATION

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 74,226, Sep. 10, 1979, which is a continuation of Ser. No. 869,347, Jun. 13, 1978, abandoned. This application Jul. 25, 1980, Ser. No. 172,335
Int. Cl.[3] B01J *20/10, 20/08, 20/04*
U.S. Cl. 252—455 R **3 Claims**

1. A method of producing an adsorbent for polyol purification comprising a synthetic amorphous silica having at least 70% of the silica larger than 44 microns produced by the method comprising the steps of:

(a) subjecting an aqueous dispersion including finely divided silica and a sodium hydroxide to hydrothermal treatment at a temperature in the range from about 138 to 210 degrees Celsius and for a period of time of from about 2.5 to 4.5 hours and sufficient to react the silica and said sodium hydroxide to form a reaction mixture of partly polymerized sodium silicate, said aqueous dispersion having a silica/sodium oxide weight ratio of at least 1.8:1;

(b) spray-drying said reaction mixture at a temperature of at least 204 degrees Celsius to form minute hollow spheres of sodium polysilicate having a bulk density of about 0.4 g/cc;

(c) reacting the polysilicate with a 5 to 15% sulfuric acid solution to form a synthetic amorphous silica; and

(d) filtering, washing and drying the synthetic amorphous silica.

2. A method of producing an adsorbent according to claim 1 wherein a metal cation adduct selected from the group consisting of aluminum, magnesium, zinc and calcium is added to said synthetic silica until the silica contains up to 5% by weight of said metal cation adduct.

4,296,001

TITANIUM IMPREGNATED SILICA-CHROMIUM CATALYSTS

Gil R. Hawley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 6, 1980, Ser. No. 118,838
Int. Cl.[3] B01J *21/06, 23/26*
U.S. Cl. 252—458 **38 Claims**

1. A process for producing a chromium-containing catalyst comprising impregnating a dry silica xerogel, formed by drying a silica hydrogel, with an aqueous solution of a hydrolysis resistant titanium compound.

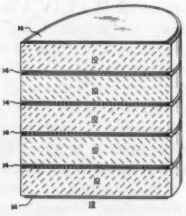
11. A process for preparing a chromium-containing catalyst comprising forming a silica hydrogel containing a hydrolysis resistant titanium compound, and drying said hydrogel to form a xerogel.

4,296,002

METAL OXIDE VARISTOR MANUFACTURE

Theodore O. Sokoly, Racine, and John Niedzialkowski, Milwaukee, both of Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jun. 25, 1979, Ser. No. 51,872
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—518 **6 Claims**



1. A method of making a metal oxide varistor, which comprises the steps of:

forming a powdered mixture comprised of at least one electrically conductive metal oxide powder, and a small percentage of at least one preselected powdered additive, said additive being selected from the group consisting of different metal oxides and metal florides;

forming of said powdered mixture, by pressing, a plurality of

blocks, each having complementary top and bottom surfaces,

forming a stack of said plurality of blocks; (and)

sintering said stack of blocks, whereby said complementary abutting top and bottom surfaces of adjacent blocks are bonded together to form a varistor; and

applying metallic contacts only to the top and bottom surfaces of said varistor.

4,296,003

ATOMIZED DIELECTRIC FLUID COMPOSITION WITH HIGH ELECTRICAL STRENGTH

Ronald T. Harrold, Murrysville, and Lawrence E. Ottenberg, East Huntingdon Township, Westmorland County, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 27, 1980, Ser. No. 163,901

Int. Cl.³ H01B 3/24

U.S. Cl. 252—570 **14 Claims**

1. A dielectric fluid composition consisting of a mixture of

(a) a first fluid selected from the group consisting of electronegative gases, electropositive gases, and mixtures thereof, and

(b) a second fluid including an atomized liquid selected from the group consisting of chlorinated liquids, fluorocarbon liquids, and mixtures thereof and having a droplet size of from about 0.1μ to about 25μ in diameter, and wherein the mixture has a pressure of from about 40 Torr to about 730 Torr.

4,296,004

POLYCYCLIC POLYAMINES

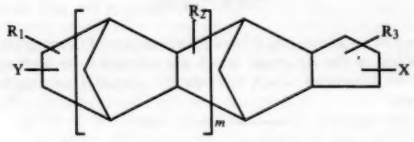
Edgar R. Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Division of Ser. No. 74,368, Sep. 10, 1979, Pat. No. 4,229,376. This application May 23, 1980, Ser. No. 152,905

Int. Cl.³ C08G 59/50

U.S. Cl. 260—18 EP **12 Claims**

1. A process for curing a polyamine of the formula:



wherein the above formula m is equal to 0 or 1; x and y are selected from the group consisting of:

$-CH_2NH_2$; $-CH_2NH(CH_2CHR_4CH_2NH_2)$; and

$-CH_2N(CH_2CHR_4CH_2NH_2)_2$, and mixtures thereof,

wherein R_1, R_2, R_3, and R_4 are hydrogen or methyl and mixtures thereof, provided that both x and y may not be CH_2NH_2 comprising contacting the amine with an epoxy resin.

4,296,005

ADDUCTS CONTAINING HYDROXYL GROUPS FROM MONONUCLEAR HYDANTOIN GLYCIDYL COMPOUNDS AND NON-AROMATIC DICARBOXYLIC ACIDS

Marianne Di Benedetto, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 107,234, Dec. 26, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 200,739

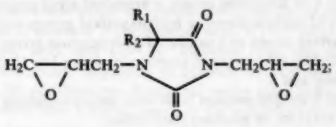
Int. Cl.³ C08G 59/26, 63/46, 63/42, 12/42

U.S. Cl. 260—18 EP **14 Claims**

1. An advanced addition product containing hydroxyl groups, which is obtained by heating a mixture comprising:

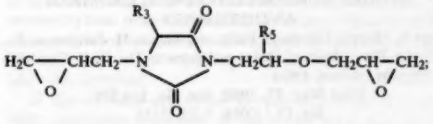
(a) one equivalent of a mononuclear hydantoin glycidyl compound selected from the group consisting of

(1) a compound of the formula I



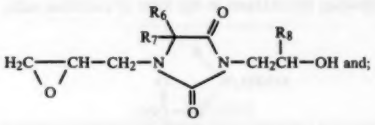
(I)

(2) a compound of the formula II



(II)

(3) a compound of the formula III



(III)

(4) any combination of compounds of the formulae I, II, or III,

wherein R_1, R_2, R_3, R_4, R_6 and R_7 are independently alkyl of 1 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms or R_1 and R_2 together, R_3 and R_4 together and R_6 and R_7 together are tetramethylene or pentamethylene, and R_5 and R_8 independently are hydrogen or methyl;

(b) 0.7 to 2.0 equivalents of a non-aromatic dicarboxylic acid of 9 to 44 carbon atoms; and

(c) 0.0 to 0.5 equivalents of a monocarboxylic acid of 6 to 18 carbon atoms.

4,296,006

BINDER FOR COATING COMPOSITIONS AND ITS USE

Volker Bugdahl; Gerhard Morlock; Werner Reidt, all of Hanau, and Emil Kerschner, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,492

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906844

Int. Cl.³ C09D 3/58

U.S. Cl. 260—23 EP **18 Claims**

1. A binder for coating compositions based on a mixture of an unsaturated β-hydroxy ester with copolymerizable monomers, said binder consisting essentially of, on a total weight basis

(A) 25 to 60 weight percent of an unsaturated β-hydroxy ester which is produced by reacting an epoxy resin based on bisphenol A and epichlorohydrin with a molecular weight between 800 and 3000 and an epoxide equivalent weight between 400 and 2500 with a mixture of

(a) 74 to 64 mole percent of methacrylic acid, acrylic acid, or a mixture of methacrylic acid and acrylic acid, and

(b) 26 to 36 mole percent of at least one saturated aliphatic monocarboxylic acid having 8 to 20 carbon atoms or a mixture of at least one saturated aliphatic monocarboxylic acid having 8 to 20 carbon atoms with up to 20 mole percent of an unsaturated aliphatic monocarboxylic acid having 8 to 20 carbon atoms, and

(B) 75 to 40 weight percent of a mixture based on the weight of component (B) of

(a) 70 to 95 weight methyl methacrylate,

(b) 30 to 5 weight percent of at least one monomer of the

formula $CH_2{=}CR_1{-}COOR_2$ where R_1 is hydrogen or a methyl group and R_2 is a straight chain alkyl group with 4 to 10 carbon atoms, a branched alkyl group with 6 to 12 carbon atoms, a hydroxy-alkyl group with 2 to 4 carbon atoms or a saturated hydrocarbon group interrupted by ether oxygen atoms containing 3 to 10 carbon atoms; and

(c) 0 to 3 weight percent of at least one crosslinking agent for acrylate or methacrylate resins.

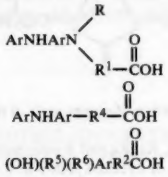
4,296,007

NITRILE RUBBER CONTAINING CADMIUM ANTIOXIDANTS

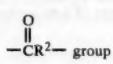
Roger E. Morris, Cuyahoga Falls, and August H. Jorgensen, Jr., Rocky River, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 27, 1980, Ser. No. 134,591
Int. Cl.³ C08K *5/18, 5/13*
U.S. Cl. 260—23.7 N **20 Claims**

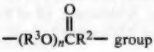
1. Nitrile rubber, which is a polymer of a nitrile and more than 40% diene, containing an effective amount of one or more of the following anitoxidants in the form of cadmium salts:



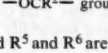
where Ar is an aromatic group; R is hydrogen, alkyl group of 1 to 4 carbon atoms, or oxyalkylene group of 1 to 4 carbon atoms; R^1 is alkylene group of 1 to 20 carbon atoms,



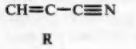
where R^2 is alkylene group of 1 to 20 carbon atoms,



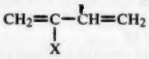
where R^3 is alkylene group of 1 to 8 carbon atoms, and n is a number of 1 to 20; R^4 is



or $—OR^2—$ group; and R^5 and R^6 are same or different groups attached to the Ar group which are selected from hydrogen and alkyl radicals which individually contain 1 to 8 carbon atoms; the nitrile is defined by the formula

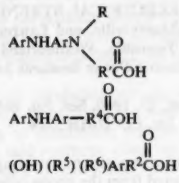


where R is selected from hydrogen, halogens, alkyl radicals of 1 to 8 carbon atoms, and aryl radicals; and the diene is defined by the formula

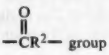


where X is selected from hydrogen, halogens, alkyl radicals of 1 to 5 carbon atoms, and aryl radicals.

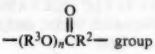
13. In the process for making finished synthetic nitrile rubber, the improvement comprising contacting nitrile rubber latex wherein the nitrile rubber is a polymer of a nitrile and more than 40% diene with cadmium coagulating agent and an effective amount of one or more of the antioxidants, in the form of alkali metal salts which are converted to cadmium salts upon contact with the cadmium coagulating agent, the antioxidants are represented by the following formulas:



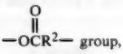
where Ar is an aromatic group; R is hydrogen, alkyl group of 1 to 4 carbon atoms, or oxyalkylene group of 1 to 4 carbon atoms; R′ is alkylene group of 1 to 20 carbon atoms,



where R^2 is alkylene group of 1 to 20 carbon atoms,



where R^3 is alkylene group of 1 to 8 carbon atoms, and n is a number of 1 to 20; R^4 is



or $—OR^2—$ group; and R^5 and R^6 are same or different groups attached to the Ar group which are selected from hydrogen and alkyl radicals which individually contain 1 to 8 carbon atoms.

4,296,008

SEALANT COMPOSITION

David J. St. Clair, and Earle E. Ewins, Jr., both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 21, 1980, Ser. No. 142,311
Int. Cl.³ C08L *93/00;* **C08J** *3/00*
U.S. Cl. 260—27 BB **8 Claims**

1. A sealant composition possessing excellent oxidative and UV stability along with improved tack, reduced melt viscosity, and a cohesive failure mechanism in the 180° peel test comprises:

(a) 100 parts by weight of a selectively hydrogenated block copolymer component comprising an A′B′ block copolymer and a multiblock copolymer having at least two end blocks A and at least one mid block B wherein the A′ and A blocks are monoalkenyl arene polymer blocks and the B′ and B blocks are substantially completely hydrogenated conjugated diene polymer blocks, the number average molecular weight of the A′ and A blocks are between about 3,000 and about 7,000, and the monoalkenyl arene content of the multiblock copolymer is between about 7% and about 22% by weight, wherein the weight ratio between the A′ B′ block copolymer and the multiblock copolymer is 20:80 to about 60:40;

about 50 to about 350 parts by weight of a tackifying resin compatible with block B;

(c) about 0 to about 100 parts by weight of a plasticizer; and

(d) about 0.1 to about 10 parts by weight of a silane coupling agent.

4,296,009

WAX-CONTAINING UNSATURATED POLYESTER LAMINATING COMPOSITION WITH AROMATIC TERTIARY AMINE

Edward J. Kerle, Granville, and Terry R. Beaver, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 7, 1980, Ser. No. 110,166

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—28.5 R **3 Claims**

1. In a laminating composition comprising (i) an ethylenically unsaturated polyester polymer, (ii) an ethylenically unsaturated curing agent comprising styrene, (iii) a free radical catalyst for the cure reaction of said polyester polymer and said curing agent and (iv) paraffin wax, the improvement for enhancing interlaminar adhesion in cured laminates prepared therefrom which comprises said composition (v) further comprising at least about 0.1 percent by weight of a tertiary monoamine having a single aromatic group and two alkyl or hydroxy alkyl groups joined to the amino nitrogen atom thereof and (vi) containing no more than about 10 percent by weight of non-reinforcing filler, where both percentages are based on the total weight of said polymer and said curing agent.

4,296,010

RESIN COMPOSITION FOR CATIONIC ELECTRODEPOSITING PAINTS

Akira Tominaga, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Jan. 30, 1980, Ser. No. 116,780

Claims priority, application Japan, Mar. 26, 1979, 54-34227

Int. Cl.³ C08L *75/04*

U.S. Cl. 260—29.2 TN **14 Claims**

1. A resin composition for cationic electrodepositing paints which has a high throwing power and does not foul a top coated film and is particularly suitable for two-coat finishing, said resin composition comprising the reaction product of

[A] a basic polyamino resin containing amino groups and/or hydroxyl groups capable of reacting with isocyanate groups, with

[B] a polyisocyanate mixture composed of

(i) 40 to 95 mole% of a low-volatile partially blocked aromatic polyisocyanate containing at least two benzene rings having an isocyanate group directly bonded to a nuclear carbon atom, in which substantially all isocyanate groups except one are blocked with an alcohol,

(ii) 2.5 to 50 mole% of a low-volatile fully blocked aromatic polyisocyanate containing at least two benzene rings having an isocyanate group directly bonded to a nuclear carbon atom, and

(iii) 2.5 to 40 mole% of a difunctional polyisocyanate,

the mole percentages being based on the total amount of the polyisocyanates (i), (ii) and (iii).

4,296,011

EPOXY ESTER COPOLYMER AQUEOUS DISPERSIONS

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 18,887, Mar. 9, 1979, Pat. No. 4,247,659, which is a continuation-in-part of Ser. No. 885,036, Mar. 9, 1978, abandoned. This application Oct. 6, 1980, Ser. No. 194,128

Int. Cl.³ C08L *61/06*

U.S. Cl. 260—29.3 **13 Claims**

1. Epoxy ester copolymer soluble in water with the aid of an amine comprising the hydroxy functional epoxy ester of a polyepoxide having an average molecular weight of about 300 to about 1100 and a 1,2-epoxy equivalency of about 1.4 to about 2.0, esterified with an at least approximately stoichiometric proportion, based on epoxide functionality, of monocarboxylic acid selected from benzoic acid, C_1–C_8 alkyl substituted benzoic acid, and C_6–C_{10} alkanoic acid, the esterification reaction being continued to provide an acid number of less than 20, said hydroxy functional epoxy ester being polyesterified with from 1.5–8%, based on the weight of the epoxy ester, of a monoethylenically unsaturated dicarboxylic acid which resists homopolymerization to an acid number of less than 20, and said polyester being copolymerized with from 15% to 70% of monoethylenic monomers, based on the copolymer, said monoethylenic monomers including carboxyl functional monomer providing an acid number of from 20–100 in the copolymer, said copolymer being dispersed in water in the form of a salt with an amine.

12. Epoxy ester copolymer as recited in claim 1 in which said copolymer is present in admixture with from 5–40%, based on total resin solids, of an aminoplast or phenoplast resin.

4,296,012

SIZING COMPOSITIONS INCORPORATING KETENE DIMER

Toshiharu Okumichi; Osamu Oseto, both of Suita; Keizo Matsumoto, Hirakata; Shigenori Thuzimoto, and Hisanari Sanda, both of Osaka, all of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 10, 1979, Ser. No. 101,768

Claims priority, application Japan, Dec. 28, 1978, 53-161560; Feb. 28, 1979, 54-23631

Int. Cl.³ C08L *23/18, 25/06, 95/00*

U.S. Cl. 260—29.6 XA **7 Claims**

1. A sizing composition for cellulosic fiber sheets comprising water and finely divided solid particles dispersed in the water, said solid particles being a uniform mixture of about 40 to about 96% by weight of a ketene dimer and about 4 to about 60% by weight of a noncrystalline hydrocarbon resin formed by dissolving one in the other.

4,296,013

VINYLIDENE CHLORIDE POLYMER MICROGELS

Dale S. Gibbs, Midland, Mich., assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 942,515, Sep. 15, 1978. This application Dec. 13, 1979, Ser. No. 103,020

Int. Cl.³ C08L *27/08*

U.S. Cl. 260—29.6 TA **4 Claims**

1. A coating latex containing discrete, cross-linked vinylidene chloride polymer microgels, said latex comprising the product obtained by emulsion polymerizing (a) about 88 to about 92 parts by weight of vinylidene chloride; (b) about 6 to about 12 parts by weight of methyl acrylate or methyl methacrylate; (c) about 1 to about 5 parts by weight of a copolymerizable crosslinking polyfunctional comonomer; and (d) about 1 to about 10 parts by weight of a comonomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, and fumaric acid, said microgels having a particle size of about 0.1 to about 0.5 micron, a gel content of about 1 to about 50 percent, and a second order transition temperature less than about 30° C.

4,296,014

AQUEOUS DISPERSION TYPE THERMOSETTING COATING COMPOSITION

Masaaki Hayashi, Tokyo; Hiroharu Sasaki, Yamato, and Kazuyoshi Tsuneta, Yokohama, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Japan

Filed Dec. 17, 1979, Ser. No. 104,447

Claims priority, application Japan, Oct. 26, 1978, 53-132000; Dec. 19, 1978, 53-156653; Dec. 26, 1978, 53-164179

Int. Cl.³ C08L *67/06*

U.S. Cl. 260—29.6 NR **13 Claims**

1. An aqueous dispersion type thermosetting coating composition comprising (A) fine thermosetting water-insoluble resin particles consisting essentially of (a) a preformed polyester-modified vinyl resin having a hydroxyl value of 30 to 200, which is formed by solution graft-polymerizing (i) an unsaturated polyester resin formed by reaction between an unsaturated dicarboxylic acid and a polyhydric alcohol, with (ii) at least one α,β-monoethylenically unsaturated monomer, and optionally with (iii) a phosphoric acid group-containing α,β-monoethylenically unsaturated monomer, and (b) a preformed cross-linkable copolymer resin derived from a monomer mixture comprising (iv) an N-alkoxymethylated monomer of an α,β-monoethylenically unsaturated carboxylic acid amide and (ii) at least one α,β-monoethylenically unsaturated monomer, (B) a surface active agent and/or a thickener, and (C) a necessary amount of water.

4,296,015

MOLDED ARTICLE OF HYDROUS POLYMER AND PROCESS FOR PRODUCING THE SAME

Seiji Aotani, Yokohama, and Hisanori Kanayama, Machida, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1980, Ser. No. 115,098

Claims priority, application Japan, Jan. 30, 1979, 54/8739

Int. Cl.³ C08K *5/06*

U.S. Cl. 260—29.6 ME **22 Claims**

1. A molded article of hydrous polymer comprising a polymer latex or a macromolecular substance latex, an oily substance, and an additive selected from the group consisting of a polyether and a combination of a polyvalent metal compound and a polyether, said polymer latex or macromolecular substance latex containing anionic groups, having a polymer concentration of 20–70% by weight, and being selected from the group consisting of:

(a) polymer latexes prepared by emulsion polymerization process,

(b) polymer latexes obtained by re-emulsification process, and

(c) natural macromolecular substance latexes;

wherein said polyether is selected from the group consisting of polyoxypropylene, oxyethylene-oxypropylene copolymer and polyoxytetramethylene; and

wherein the amounts of the oily substance and the polyether are 10–200 parts by weight and 0.5–30 parts by weight, respectively, per 100 parts by weight of said polymer latex.

4,296,016

METHOD OF PREPARING A POLYMERIC ELECTROLYTE PARTICULARLY FOR AN ELECTRO-OPTICAL DEVICE

Jean-Paul Randin, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

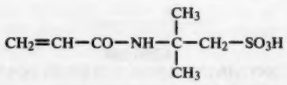
Filed Apr. 2, 1980, Ser. No. 136,466

Claims priority, application Switzerland, May 3, 1979, 133/79

Int. Cl.³ C08K *3/00*

U.S. Cl. 260—29.6 SQ **5 Claims**

1. A method of preparing a proton polymeric electrolyte, particularly for an electro-optical device, which is a mixture of poly[2-acrylamido-methylpropanesulphonic acid] and water and containing pigment distributed substantially homogeneously, comprising forming a suspension of a said pigment in water, dissolving 5 to 50% by weight of a monomer of the formula



or a salt thereof in the suspension, adding a polymerisation initiator to the mixture, carrying out the polymerisation reaction with agitation, and evaporating part of the water until the water content is less than 52% of the weight of the dry polymer, the pigment being present in the amount of 2 to 25% by weight of the dry polymer.

4,296,017

GRAFT COPOLYMER PRESSURE-SENSITIVE ADHESIVES, THEIR MANUFACTURE AND USE

Rudolf Weissgerber; Alois Stoll; Herbert Kandler; Hans-Herbert Nunner; Christine Eichelseder, and Helmut Pangeri, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 18, 1980, Ser. No. 113,259

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903687

Int. Cl.³ C08F *261/04, 263/02, 263/04;* C08L *39/06*

U.S. Cl. 260—30.6 R **8 Claims**

1. A graft copolymer for use as a polymeric pressure-sensitive adhesive consisting of

(I) from 5% to 30% by weight of a graft base soluble in the monomer component selected from the group consisting of

(i) a copolymer of 40% to 85% by weight of said copolymer of ethylene units, 15% to 60% by weight of said copolymer of vinyl acetate units and 0 to 10% by weight of said copolymer of monomer units copolymerizable with ethylene and vinyl acetate,

(ii) said copolymer with up to 10% by weight of said copolymer of vinyl alcohol units derived from vinyl acetate units, and

(iii) mixtures of 25% to 99.9% by weight of said copolymer with from 0.1% to 75% by weight of other graftable polymers soluble in the monomer component, and

(II) from 70% to 95% by weight of a monomer mixture grafted to said graft base consisting of

(a) from 30% to 80% by weight of said mixture of vinyl esters of alkanoic acids having 2 to 4 carbon atoms,

(b) from 20% to 70% by weight of said mixture of monomers selected from the group consisting of vinyl esters of alkanoic acids having 6 to 18 carbon atoms, esters of α,β-alkenoic acids having 3 to 8 carbon atoms, with alkanols having 3 to 18 carbon atoms, esters of alkenedioic acids having 4 to 8 carbon atoms, with alkanols having 3 to 18 carbon atoms, and mixtures thereof,

(c) from 0.5% to 15% by weight of said mixture, of N-vinyl-2-pyrrolidone,

(d) from 0 to 20% by weight of other olefinically-unsaturated compounds copolymerizable with said components (a), (b) and (c), and

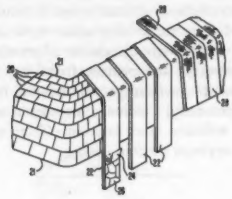
(e) from 0 to 25% by weight of a plasticizer.

4,296,018

CATECHOL OR PYROGALLOL CONTAINING FLEXIBLE INSULATING TAPE HAVING LOW GEL TIME

James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 17, 1979, Ser. No. 39,918
Int. Cl.[3] B32B *19/02, 27/38;* C08K *5/07, 5/13*
U.S. Cl. 260—32.8 EP 8 Claims



1. A composition comprising:

(A) semi-solid epoxide, a mixture of solid epoxide and liquid epoxide or a mixture of semi-solid epoxide and liquid epoxide, with a solvent for said epoxide selected from the group consisting of ketones, aromatic hydrocarbons, and mixtures thereof, where the weight ratio of total epoxide to total solvent is from about 85:15 to about 10:90;

(B) about 0.01 to about 5.0 phr of an organo-tin compound having the structural formula:

$$(R)_3\,SnX$$

where each R is independently selected from the group consisting of alkyl groups having from about 1 to 10 carbon atoms, aryl groups, Cl, Br, or NO_2 substituted aryl groups, alkaryl groups with the alkyl constituent having from 1 to 10 carbon atoms, Cl, Br, or NO_2 substituted alkaryl groups with the alkyl constituent having from about 1 to 10 carbon atoms, aralkyl groups with the alkyl constituent having from about 1 to 10 carbon atoms, cyclopentane, groups, cyclopentene groups, cyclopentadiene groups, cyclohexane groups, cyclohexene groups, cyclohexadiene groups, pyrrolidine groups, pyrrole groups, tetrahydrofuran groups, dioxane groups, pyridine groups and piperdine groups, and each X is selected from the group consisting of halide, hydroxide, acetate, butyrate, propionate, and dimethyl phosphate; and

(C) about 0.001 to about 1 phr of an activator selected from the group consisting of catechol, pyrogallol, and mixtures thereof.

4,296,019

SOLVENT BLENDS FOR ETHYLENE COPOLYMERS

Alfred R. Nelson, Edenville, and Kenneth E. Johnsen, Midland, both of Mich., assignors to The Dow Chemical Co., Midland, Mich.

Filed Nov. 29, 1979, Ser. No. 98,465
The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.
Int. Cl.[3] C08K *5/05*
U.S. Cl. 260—33.4 R 9 Claims

1. A solution comprising a solvent blend which comprises from about 5 to about 35 percent by weight of an acyclic alcohol selected from the group consisting of ethanol, propanol, isopropanol, n-butanol, isobutanol and t-butanol, based upon the total weight of said solvent blend, about 3 percent to about 90 percent by weight of a monocyclic aromatic hydrocarbon, based upon the total weight of said solvent blend, and from about 5 to about 92 percent by weight of a halogenated C_2 hydrocarbon, based upon the total weight of said solvent blend, and a copolymer of ethylene and ethylenically unsaturated carboxylic acid, or an ionic metal salt thereof, having from about 2.5 to about 30 percent by weight of said carboxylic acid, based on the total weight of said copolymer, characterized in that said copolymer remains dissolved at a temperature of at least 60° C.

4,296,020

POLYUREA THICKENED MOLDING COMPOSITIONS

Juan J. Magrans, Jr., Newark, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Oct. 29, 1979, Ser. No. 89,128
Int. Cl.[3] C08L *67/00, 75/02, 75/06*
U.S. Cl. 260—37 N 17 Claims

1. A resin blend useful in preparing non-sticky molding compositions by the reaction therewith of polyisocyanate which comprises: an ethylenically unsaturated monomer containing dissolved therein 30–70% by weight of a resin selected from the group consisting of vinyl terminated polyester urethane resin, ethylenically unsaturated polyester resins, and ethylcnically unsaturated polyisocyanurate resins, and 1.5–30% by weight of at least organic polyamine polyurea precursor free of ethylenic unsaturation selected from the group consisting of polyalkylene polyamines and cyanoalkylated polyoxyalkylene polyamines having a molecular weight of about 190–2000 having a general formula selected from the group consisting of:

$$H_2NCH_2\text{-}CXH(OCH_2CX)_yNH_2$$

wherein X is H or an alkyl group having 1–18 carbon atoms and where y is a number of about 2 to about 16,

A triamine of polyalkoxylated trimethylol propane having the general formula:

$$CH_3CH_2C[CH_2(O\text{-}CH_2\text{-}CHX)_zNH_2]_3$$

where z is an average of 1–11, and

A cyanoethylated polyoxyalkylated polyamines having the general formula:

$$R[(OCH_2CHX)_nOCHYCHZNHA]_m$$

where R is the nucleus of an oxylation-susceptible aliphatic polyhydric alcohol containing 2–12 carbon atoms and 2–8 hydroxyl groups, A is hydrogen or a cyano lower alkyl radical having 1 or 2 carbon atoms between the hydrogen and the cyano radical provided at least one A is a cyano-lower-alkyl radical, Z is an alkyl group containing 1–18 carbon atoms, X and Y are hydrogen or Z, n has an average value of 0–50 and m is 2–8, R saturated and consists of carbon and hydrogen wherein there is a reaction product of the polyisocyanate with the polyamine polyurea precursor.

4,296,021

REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS HAVING IMPROVED HIGH VOLTAGE BREAKDOWN RESISTANCE

Allen D. Wambach, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 6, 1976, Ser. No. 747,634
Int. Cl.[3] C08K *3/34, 3/40*
U.S. Cl. 260—40 R 12 Claims

1. A method of improving the high voltage dielectric breakdown characteristics of reinforced thermoplastic compositions comprising adding to a polybutylene therephthalate resin a reinforcing agent comprising (i) aluminum silicate, alone, or in combination with (ii) glass fibers, said reinforcing agent being present in an amount of up to 60% by weight of said reinforced thermoplastic composition and in an amount at least sufficient to reinforce the composition but in an amount not in excess of that which impairs the long term high voltage breakdown resistance of the composition in comparison with a corresponding unfilled composition or one wherein the filler consists essentially of glass fibers.

4,296,022

POLYPROPYLENE BLEND COMPOSITIONS

Robert L. Hudson, Severna Park, Md., assignor to Chevron Research, San Francisco, Calif.

Filed Jun. 4, 1980, Ser. No. 156,521
Int. Cl.[3] C08L 23/12
U.S. Cl. 260—42.46 5 Claims

1. A polypropylene resin blend, useful for melt-spinning fine denier yarns, which comprises, per 100 parts by weight of total polypropylene resin, about from 70–95 parts of a first polypropylene resin having a melt flow index about of from 30 to 38 and a swell index of about from 1.8 to 2.3; about from 5 to 30 parts of a second polypropylene resin having a melt flow index of about from 4 to 35 and a swell index of about from 5 to 7; and about 0.2 to 0.5 parts of a hindered phenol melt flow stabilizer for retarding polypropylene polymer degradation during melt extrusion.

4,296,023

VINYL CHLORIDE POLYMER COMPOSITIONS WITH REDUCED COMBUSTIBILITY AND REDUCED SMOKE FORMATION UNDER CONDITIONS OF FIRE

Hubertus J. Vroomans, Beek, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed May 30, 1980, Ser. No. 154,898
Claims priority, application Netherlands, Jun. 1, 1979, 7904369; Jun. 27, 1979, 7904991; Oct. 17, 1979, 7907651
Int. Cl.[3] C08K 3/24
U.S. Cl. 260—45.75 F 8 Claims

1. A vinyl chloride polymer composition having an oxygen index according to ASTM D 2863 of at least 60 and reduced smoke formation under conditions of fire, said composition contains a zinc titanate,

which zinc titanate is composed to a large extent of by weight of spinel crystal structure,

present in an amount from 0.05 to 5 parts by weight per 100 parts by weight of said vinyl chloride polymer.

4,296,024

HUMAN IMMUNE SERUM GLOBULIN WITH HIGH HEPATITIS A ANTIBODY TITER

William J. McAleer, Ambler, and William J. Miller, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 813,566, Jul. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 610,499, Sep. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 531,020, Dec. 9, 1974, abandoned. This application Jan. 5, 1979, Ser. No. 1,133
Int. Cl.[3] C07G 7/00
U.S. Cl. 260—112 B 5 Claims

1. Human immune serum globulin having a hepatitis A antibody titer of at least about 75,000 IAHA units/ml.

4,296,025

PROCESS FOR PREPARING HUMAN INTERFERON

Kaname Sugimoto, Okayama, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed May 13, 1980, Ser. No. 149,533
Claims priority, application Japan, May 24, 1979, 54-63210
Int. Cl.[3] C07G 7/00; A61K 45/02
U.S. Cl. 260—112 R 4 Claims

1. A process for preparing human interferon, comprising exposing human leukocyte suspension to both Type I and Type II interferon inducers to induce interferon, and purifying and collecting the induced interferon.

4,296,026

PRODUCTION OF SOYBEAN PROTEIN ISOLATE OF IMPROVED PURITY

Donald B. Millar, Toronto, Canada, assignor to General Foods Inc., Toronto, Canada

Filed Sep. 22, 1980, Ser. No. 189,646
Int. Cl.[3] A23J 1/14
U.S. Cl. 260—123.5 8 Claims

1. In a process for the formation of a soybean protein isolate by contacting soybeans with an aqueous sodium chloride solution of ionic strength of at least about 0.2 molar to solubilize the protein, diluting the protein solution to an ionic strength sufficient to form a protein dispersion of protein in the aqueous phase, and collecting the protein from the dispersion as an amorphous mass of soybean protein isolate, the improvement which comprises using calcium chloride in said aqueous sodium chloride solution in an amount effective to increase the purity of said soybean protein isolate.

4,296,027

PURE INTRAVENOUS HUMAN AND ANIMAL GAMMA GLOBULINS

Richard M. Condie, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 829,565, Aug. 31, 1977, Pat. No. 4,136,094. This application Jan. 22, 1979, Ser. No. 5,150
Int. Cl.[3] C07G 7/00
U.S. Cl. 260—112 B 9 Claims

1. An isolated natural, unaltered, unfragmented, undenatured monomeric immune gamma globulin for intravenous administration characterized by 99% purity and containing less than 1% aggregates and less than 1% dissociated materials.

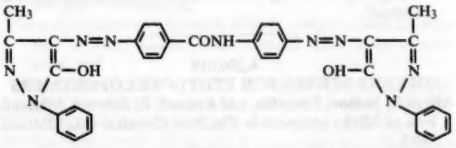
4,296,028

PYRAZOLONYL SUBSTITUTED DISAZO PIGMENTS

Ugo Moiso, 5, Viale Rimembranze; Vincenzo Massabo, 10, Viale Rimembranze, and Danilo Domenis, 43, Via S. Giuseppe, all of Saronno (Varese), Italy

Division of Ser. No. 274,670, Jul. 24, 1972, abandoned. This application Sep. 30, 1977, Ser. No. 838,128
Claims priority, application Italy, Jul. 26, 1971, 7669 A/71; Dec. 29, 1971, 33062 A/71
Int. Cl.[3] C09B 33/12, 33/13, 33/153; D06P 1/04
U.S. Cl. 260—160 1 Claim

1. A disazo pigment of the formula:



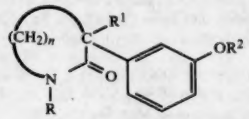
4,296,029

PROCESS FOR PREPARING HEXAHYDROAZEPINE, PIPERIDINE AND PYRROLIDINE DERIVATIVES

Brian J. Bushell, Portsmouth; John F. Cavalla, Isleworth; Robin G. Shepherd, Burnham, and Alan C. White, Windsor, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

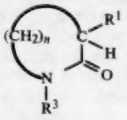
Filed Jun. 23, 1980, Ser. No. 161,992
Claims priority, application United Kingdom, Jul. 3, 1979, 23123/79
Int. Cl.[3] C07D 223/10
U.S. Cl. 260—239.3 R 15 Claims

1. A method for preparing a 2-oxo-hexahydroazepine, 2-oxopiperidine or 2-oxo-pyrrolidine of formula I

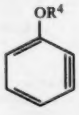


wherein n is 2, 3 or 4, R is selected from the group consisting of hydrogen, lower alkyl, phenyl(lower)alkyl, loweralkenylmethyl and cycloalkylmethyl of 3–4 carbons in the cycloalkyl moiety, R^1 is selected from the group consisting of hydrogen and lower alkyl and R^2 is selected from the group consisting of hydrogen, lower alkyl and phenyl (lower)alkyl which comprises reacting an anion of a lactam of formula III

(III)



where n and R^1 are as defined above and R^3 is lower alkyl, phenyl(lower)alkyl, trialkyl-, triaryl- or triarylalkylsilyl, loweralkenylmethyl or cycloalkylmethyl of 3–4 carbon atoms in the cycloalkyl moiety with a benzyne of formula IV



where R^4 is lower alkyl, phenyl(lower)alkyl, or trialkyl-, triaryl or triarylalkyl-silyl to give an anion of the compound of formula I where R^1 is lower alkyl or a dianion of the compound of formula I where R^1 is hydrogen and protonating the anion or dianion of the compound of formula I to give a compound of formula I.

4,296,030

METAL CHELATES OF 1,4-BIS(SUBSTITUTED-AMINO-5,8-DIHYDROXY-ANTHRAQUINONES

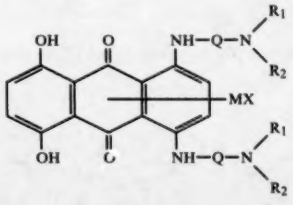
Stanley A. Lang, Jr., Stony Point, and Keith C. Murdock, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 9, 1980, Ser. No. 138,620

Int. Cl.³ C07F *3/06, 15/02, 15/06*

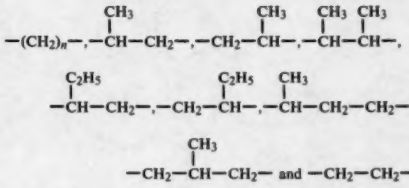
U.S. Cl. 260—239 A **9 Claims**

1. A chelated compound selected from the group consisting of those of the formula:



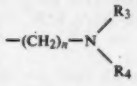
wherein Q is a divalent moiety selected from the group consisting of those of the formulae:

(I)



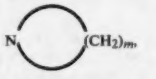
wherein n is an integer from 2 to 4 inclusive; R_1 and R_2 are each individually selected from the group consisting of hydrogen, alkyl(C_1–C_4), monohydroxyalkyl(C_1–C_4), with the proviso that the carbon atom alpha to the nitrogen atom does not bear an hydroxy group, dihydroxyalkyl(C_3–C_6), with the proviso that the carbon atom alpha to the nitrogen atom does not bear an hydroxy group, formyl, alkanoyl(C_2–C_4), trifluoroacetyl and moieties of the formulae:

$-(CH_2)_n-CN$, $-(CH_2)_n-O-R$ and



wherein n is an integer 2 to 4 inclusive, R is alkyl(C_1–C_4) and R_3 and R_4 are each individually selected from the group consisting of hydrogen, alkyl(C_1–C_4) and monohydroxyalkyl(C_2–C_4), with the proviso that the carbon atom alpha to the nitrogen atom does not bear an hydroxy group and the group

is morpholino, thiomorpholino, piperazino, 4-methyl-1-piperazino or a moiety of the formula:



wherein m is an integer 2 to 6 inclusive; with the proviso that the ratio of the total number of carbon atoms to the sum of the total number of oxygen atoms plus the total number of nitrogen atoms in the side chains at the 1-position and the 4-position does not exceed 4 and with the further proviso that R_1 and R_2 are not both hydrogen or alkyl; M is selected from the group platinum, copper, iron, zirconium, cobalt, chromium and zinc; X is chloride, sulfate or nitrate and the pharmacologically acceptable acid-addition salts thereof.

4,296,031

BENZODIAZEPINE DERIVATIVES

Albert E. Fischli, and Andre Szente, both of Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

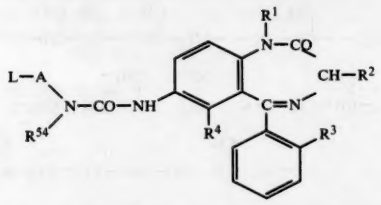
Division of Ser. No. 63,288, Aug. 2, 1979, Pat. No. 4,251,443. This application Sep. 11, 1980, Ser. No. 186,061

Claims priority, application Switzerland, Aug. 11, 1978, 8563/78; Jun. 6, 1979, 5270/79; Jul. 5, 1979, 6296/79

Int. Cl.³ C07D *243/24*

U.S. Cl. 260—239.3 D **2 Claims**

1. A compound of the formula



wherein R^1 is lower alkyl, R^2 is hydrogen or lower alkyl, R^3 is halogen and R^4 is hydrogen or halogen, A is a lower alkylene group, R^{54} is hydrogen or lower alkyl and L is selected from the group consisting of halogen, tosyloxy, mesyloxy and trimethylammonium.

4,296,032

METHOD FOR THE PREPARATION OF PENICILLANIC-β-LACTAMASE INHIBITORS

Paul M. Denerley, Horley, England, assignor to Beecham Group Limited, England

Filed Mar. 31, 1980, Ser. No. 135,316

Claims priority, application United Kingdom, Apr. 4, 1979, 11764/79

Int. Cl.[3] **C07D** *277/60*

U.S. Cl. 260—245.2 R **4 Claims**

1. A process for the preparation of an in-vivo hydrolysable ester of 6β-bromopenicillanic acid when substantially free from the corresponding in-vivo hydrolysable ester of 6α-bromopenicillanic acid which process comprises mixing isomeric in-vivo hydrolysable esters of 6α- and 6β-bromopenicillanic acids and thereafter chromatographically separating the mixture of isomers into fractions and recovering the in-vivo hydrolysable ester of 6β-bromopenicillanic acid from a fraction containing said in-vivo hydrolysable ester of 6β-bromopenicillanic acid substantially free from the in-vivo hydrolysable ester of a 6α-bromopenicillanic acid.

4,296,033

4-AZIDO-1-MERCAPTOACYL PROLINE

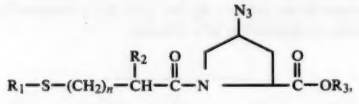
Edward W. Petrillo, Jr., Pennington, and Frank L. Weisenborn, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 23, 1980, Ser. No. 171,565

Int. Cl.[3] **A61K** *31/40, 31/445;* **C07D** *207/16, 211/34*

U.S. Cl. 260—326.2 **8 Claims**

1. A compound having the formula



or a salt thereof, wherein,

R_1 is hydrogen, alkyl, aryl, arylalkyl, alkanoyl, or arylcarbonyl;

R_2 is hydrogen, alkyl, alkylthio or trifluoromethyl;

R_3 is hydrogen, alkyl or arylalkyl; and

n is 1 or 2;

wherein the asymmetric center indicated by the asterisk (*) is in the L-configuration and wherein the term "aryl" refers to phenyl or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino, phenyl or trifluoromethyl groups.

4,296,034

POLYFLUORINATED SULFONAMIDES

Pierre Bouvet, Rouen, and Jean-Pierre Lalu, La Mulatiere, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

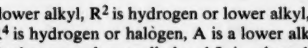
Continuation of Ser. No. 466,051, May 1, 1974, abandoned, which is a continuation of Ser. No. 5,352, Jan. 23, 1970, abandoned. This application May 24, 1979, Ser. No. 41,926

Claims priority, application France, Jan. 22, 1969, 69 01059

Int. Cl.[3] **C07D** *295/22;* **C07C** *143/75, 143/74*

U.S. Cl. 260—326.82 **2 Claims**

1. A polyfluorinated sulfonamide compound having the structure



wherein

(a) C_nF_{2n+1} corresponds to a straight or branched polyfluorinated carbon chain, n being a number of from 1 to 20;

(b) b is an integer of from 2 to 20;

(c) —NRR′ is selected from the group (d) or (e) below:

(d) N is nitrogen; R is hydrogen or an alkyl radical of from 1 to 10 carbon atoms; and R′ is hydrogen, an alkyl radical of from 1 to 10 carbon atoms, a cyclic alkyl radical of from 5 to 12 carbon atoms, or an aryl hydrocarbon radical of from 6 to 12 carbon atoms;

(e) —NRR′ is a pyrrolidine radical having the structure

4,296,035

TOTAL SYNTHESIS OF THE UTERO-EVACUANT SUBSTANCE D,L-ZOAPATANOL

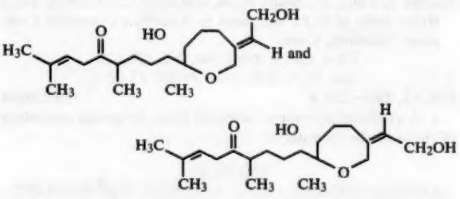
Vinayak V. Kane, Princeton, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 971,471, Dec. 20, 1979, Pat. No. 4,237,053. This application Mar. 17, 1980, Ser. No. 130,660

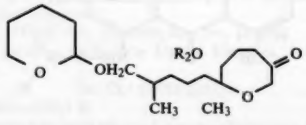
Int. Cl.[3] **C07D** *313/04*

U.S. Cl. 260—333 **3 Claims**

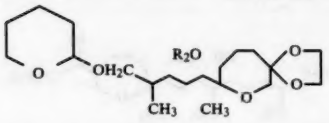
1. The process for the preparation of a compound selected from the group consisting of



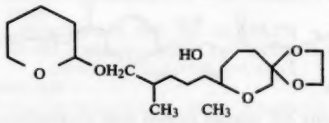
which comprises reacting a compound of the formula



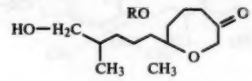
with ethylene glycol to form a ketal of the formula



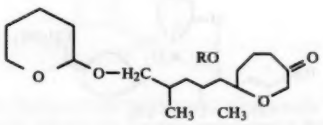
reacting the product formed with sodium in liquid ammonia to form an alcohol of the formula



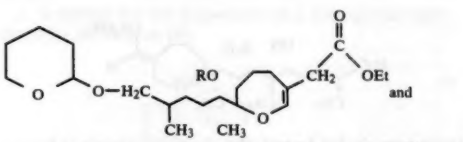
reacting the alcohol with t-butyldiphenylsilyl chloride in the presence of imidazole to form a compound of the formula



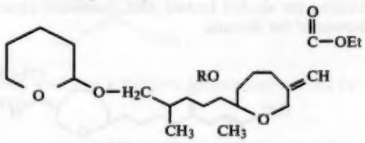
reacting the alcohol formed with dihydropyran and an acid selected from P-toluenesulfonic acid and camphorsulfonic acid to form a compound of the formula



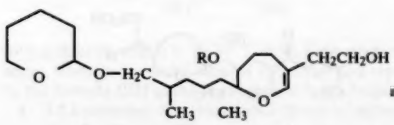
reacting the ketone with triethylphosphonoacetate to form a mixture of isomers having the formulas



and



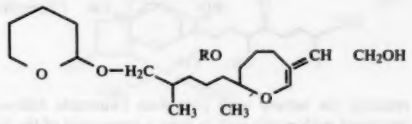
reacting the mixture with lithium aluminum hydride to form a mixture of alcohols having the formulas



and

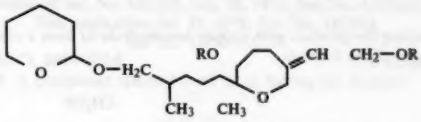
A

-continued

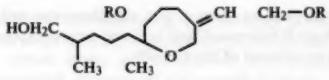


B

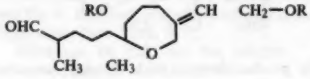
separating the alcohols, and reacting the alcohol B with t-butyldiphenylsilyl chloride to form a compound of the formula



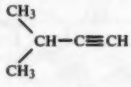
reacting the product with acetic acid to form an alcohol of the formula



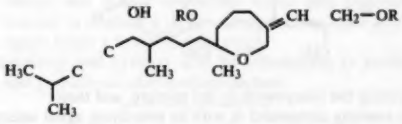
reacting the alcohol with chromium trioxide to form an aldehyde of the formula



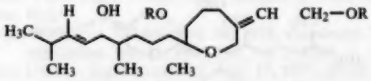
reacting the aldehyde with an acetylenic Grignard reagent prepared from



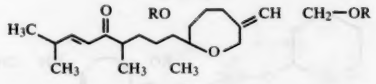
to form a compound of the formula



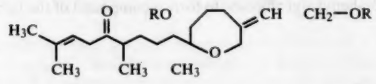
reacting the product with lithium aluminum hydride to form a compound of the formula



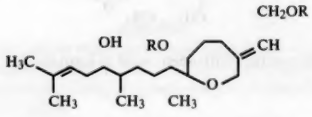
reacting the alcohol formed with an oxidizing agent selected from chromium trioxide and manganese dioxide to form a ketone of the formula



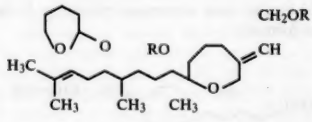
reacting the ketone with potassium t-butoxide followed by treatment with acetic acid to form a compound of the formula



reacting the product with sodium borohydride to form a compound of the formula

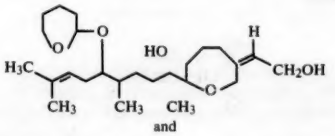


reacting the product formed with dihydropyran and an acid selected from P-toluenesulfonic acid and camphorsulfonic acid to form a compound of the formula



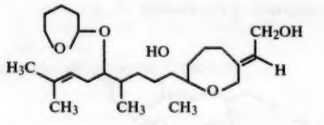
reacting the product formed with tetrabutylammonium fluoride to form a mixture of compounds of the formula

A



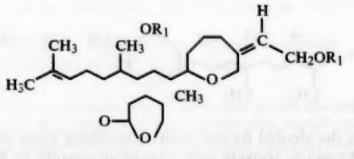
and

B

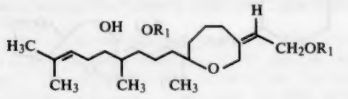


separating the compounds in the mixture, and then

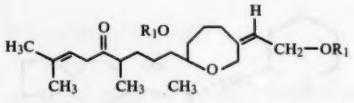
(a) reacting compound A with an esterifying agent selected from a lower alkyl anhydride or alkanoyl halide having 2–5 carbon atoms to form an ester of the formula



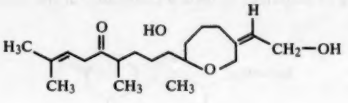
treating the product with an acid selected from acetic acid, P-toluenesulfonic acid and camphorsulfonic acid to form an alcohol of the formula



treating the alcohol formed with chromium trioxide to form a ketone of the formula

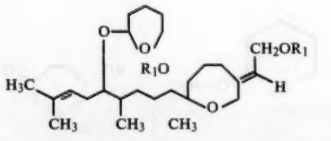


and reacting the product formed with tetrabutylammonium hydroxide to form a compound of the formula

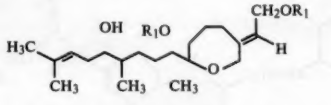


and

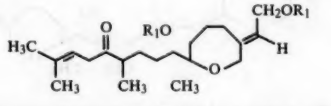
(b) reacting compound B with an esterifying agent selected from a lower alkyl anhydride or alkanoyl halide having 2–5 carbon atoms to form an ester of the formula



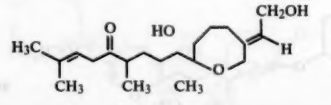
treating the product formed with an acid selected from acetic acid, P-toluenesulfonic acid and camphorsulfonic acid to form an alcohol of the formula



treating the alcohol formed with chromium trioxide to form a ketone of the formula



and reacting the product formed with tetrabutylammonium hydroxide to form a compound of the formula



wherein R is a t-butyldiphenylsilyl group, R_1 is lower alkanoyl

having 2–5 carbon atoms and R_2 is selected from the group consisting of benzyl, p-nitrobenzyl and p-methylbenzyl.

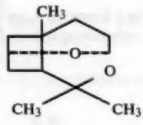
4,296,036

SELECTIVE METHOD FOR THE PREPARATION OF INSECT PHEROMONE

Kenji Mori, Tokyo, and Mitsuru Sasaki, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

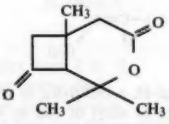
Filed Mar. 31, 1980, Ser. No. 135,274
Claims priority, application Japan, Apr. 6, 1979, 54-42138
Int. Cl.³ C07D *319/04, 305/14*
U.S. Cl. 260—340.7 **4 Claims**

1. A method for the preparation of 3,3,7-trimethyl-2,9-dioxatricyclo[3.3.1.$0^{4,7}$]nonane represented by the formula (I),



(I)

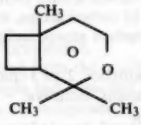
which comprises reacting a keto lactone represented by the formula (II),



(II)

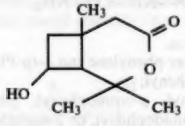
with diisobutylaluminum hydride and subsequently treating with an acid, wherein the reaction temperature is from −70° C. to +20° C., wherein the reaction time is from a moment up to one hour and wherein the molar ratio of the compound represented by the formula (II) to diisobutylaluminum hydride is 1:2-3.

2. A method for the preparation of a keto lactone represented by the formula (II),



(I)

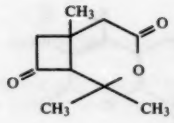
which comprises oxidizing a hydroxy lactone represented by the formula (III),



(III)

with a chromic acid at 0° to 20° C. from a moment up to two hours, wherein the molar ratio of the compound represented by the formula (III) to the chromic acid is 1:1-3 equivalents.

4. 1,5,5-trimethyl-4-oxabicyclo[4.2.0]octa-3,7-dione represented by the formula (II),



(II)

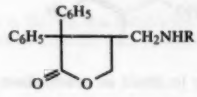
4,296,037

4,5-DIHYDRO-3,3-DIPHENYL-4-HYDROCARBYLAMINOMETHYLFURAN-2(3H) ONES

Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 615,951, Sep. 23, 1975, Pat. No. 4,119,637. This application Jul. 24, 1978, Ser. No. 127,001
Int. Cl.³ C07D *307/26*
U.S. Cl. 260—343.6 **6 Claims**

1. A compound selected from those having the formula



wherein R is selected from the group consisting of lower alkyl having one to six carbon atoms, lower cycloalkyl having four to eight carbon atoms, or phenyllower alkyl consisting of benzyl, phenethyl, phenpropyl and α-methylbenzyl.

4,296,038

PREPARATION OF (−)-DIHYDROCHRYSANTHEMOLACTONE

T. L. Ho, and Zia U. Din, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,299
Int. Cl.³ C07D *311/94*
U.S. Cl. 260—343.21 **5 Claims**

1. A process for producing (−)-dihydrochrysanthemolactone from 2-caren-4-one comprising:

methylating said 2-caren-4-one with a methylating agent selected from methyl lithium and methyl magnesium halide to produce 4-methyl-2-caren-4-ol;

oxidizing said 4-methyl-2-caren-4-ol with ozone followed by cleaving at the double bond with removal of 2 carbon atoms to produce a tautomeric mixture of cis-2,2-dimethyl-3(2'-oxopropyl) cyclopropane-carboxylic acid and cis-2-oxo-3-oxa-4,7,7-trimethylbicyclo [4.1.0] heptan-4-ol;

methylating with a methylating agent selected from methyl lithium and methyl magnesium halide said tautomeric mixture to produce a single compound that upon acidification forms a hydroxy acid; and

lactonizing said hydroxy acid by dehydration to produce said (−)-dihydrochrysanthemolactone.

4,296,039

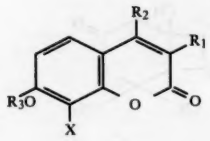
SELECTED PROCESS FOR PRODUCING MONOHALOGENATED DERIVATIVES OF 7-HYDROXY-COUMARIN

Francesco Della Valle, Padua, Italy, assignor to Fidia S.p.A., Padua, Italy

Division of Ser. No. 952,460, Oct. 18, 1978, abandoned. This application Jan. 15, 1980, Ser. No. 112,223
Claims priority, application Italy, Nov. 17, 1977, 29765 A/77
Int. Cl.³ C07D *311/08, 413/06, 405/06*
U.S. Cl. 260—343.45 **5 Claims**

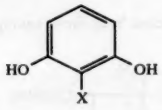
1. Process for the preparation of pure 7-hydroxycoumarin derivatives of the formula I:

I



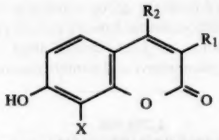
wherein X represents a halogen atom, R_1 is selected from the group consisting of piperidino ethyl, morpholino ethyl, diethylamino ethyl and diethylamino propyl, R_2 is selected from the group consisting of methyl and phenyl, and R_3 is selected from the group consisting of ethoxy-carbonyl-methyl and ethoxycarbonyl-ethyl, which process comprises (a) reacting a 2-haloresorcinol of the formula V:

V



with a β-keto ester to obtain an intermediate of the formula

VI



wherein R_1, R_2 and X are as hereinbefore indicated, and (b) subsequently reacting said intermediate VI with a compound of the formula R_3-Halogen, wherein R_3 is as before defined, in the presence of an acid-binding agent to obtain the desired compound I.

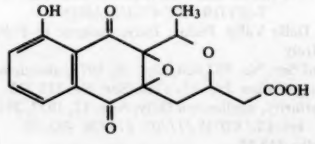
4,296,040

ANTIBIOTIC NANAOMYCIN E AND A PROCESS FOR PRODUCING THE SAME

Satoshi Omura, Tokyo; Haruo Tanaka, Machida; Itaru Takahashi, Kumamoto; Shinzo Ishii; Kazuyuki Mineura, both of Nagaizumi; Kunikatsu Shirahata, Machida, and Masaji Kasai, Fujisawa, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha and Kitasato Kenkyusho, both of Tokyo, Japan

Continuation of Ser. No. 17,314, Mar. 5, 1979, abandoned. This application Nov. 23, 1970, Ser. No. 97,001
Claims priority, application Japan, Mar. 7, 1978, 53-25041
Int. Cl.[3] C07D *311/78*
U.S. Cl. 260—345.2 **1 Claim**

1. A compound represented by the formula:



said compound having the following specific rotation $[\alpha]_D^{20} = +89.0°$ (c=0.95 in methanol).

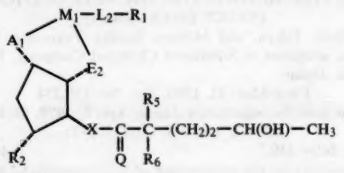
4,296,041

19-HYDROXY-7A-HOMO-PGI$_2$ COMPOUNDS

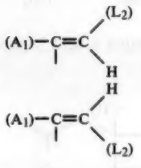
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508.
This application Mar. 3, 1980, Ser. No. 126,481
Int. Cl.[3] C07D *311/94*
U.S. Cl. 260—345.2 **7 Claims**

1. A prostacyclin-type compound of the formula



wherein A_1 is —O— (oxo) and E_2 is $—CH_2CH_2—$;
wherein L_2 is
(1) $—(CH_2)_j—$, wherein j is one to 4, inclusive,
(2) $—(CH_2)_q—CF_2—$, wherein q is one, 2, or 3, or
(3) —CH=CH—;
wherein M_1 is



wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is
(1) $—COOR_3$,
(2) $—CH_2OH$,
(3) $—CH_2N(R_7)(R_8)$,
(4) $—CO—N(R_7)(R_8)$,
(5) $—CO—NH—SO_2—R_{15}$, or
(6) tetrazolyl,
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;
(g) —(Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) $—CH_2—CO—R_{16}$,
wherein —(Ph)— is inter-phenylene and —(p-Ph) is inter-para-phenylene or para-phenyl;
wherein R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or

phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of 2 to 4 carbon atoms, inclusive,
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl,
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—.

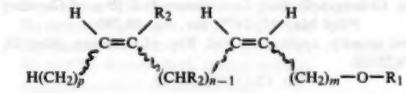
4,296,042

PREPARATION OF UNSATURATED ALIPHATIC INSECT PHEROMONES USING CYCLIC PHOSPHONIUM YLIDS

Joseph M. Muchowski, Sunnyvale, and Michael C. Venuti, San Francisco, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

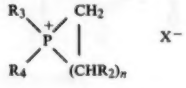
Filed Jun. 18, 1980, Ser. No. 160,711
Int. Cl.³ C07D *309/06*; C07C *41/18*; C07F *7/04*
U.S. Cl. 260—345.9 R **14 Claims**

1. A process for the preparation of a compound of the formula:



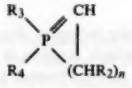
(XI)

wherein
m is an integer from 1 to 11,
n is an integer from 1 to 9,
p is an integer from 1 to 6,
R_1 is selected from the group consisting of tetrahydropyranyl, benzyl, trimethylsilyl, t-butyldimethylsilyl and triphenylmethyl;
which process comprises:
(a) contacting a cyclic phosphonium halide of the formula:



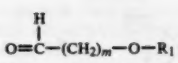
(I)

wherein
n is as set forth above,
R_2 is selected from the group consisting of hydrogen, and straight and branched chain lower alkyl groups,
R_3 and R_4 are independently selected from the group consisting of phenyl, lower alkyl-substituted phenyl, lower alkoxy-substituted phenyl, and halo substituted phenyl; and
X is a halogen selected from the group consisting of chlorine, bromine, and iodine;
with an alkali metal alkoxide to produce a ylid of the formula:



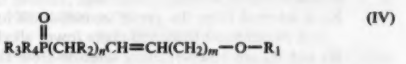
(II)

wherein n, R_2, R_3 and R_4 are as set forth above;
(b) treating said ylid with a protected hydroxy alkyl aldehyde of the formula



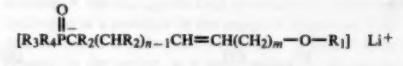
(III)

wherein R_1 and m are as set forth above, to produce a phosphine oxide of the formula:



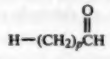
(IV)

wherein m, n, R_1, R_2, R_3 and R_4 are as set forth above;
(c) contacting said phosphine oxide with an organo lithium compound in an aprotic solvent medium to produce a lithium salt of the formula:



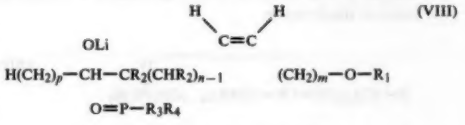
(VI)

wherein m, n, R_1, R_2, R_3, and R_4 are as set forth above;
(d) treating said lithium salt with an aldehyde of the formula:



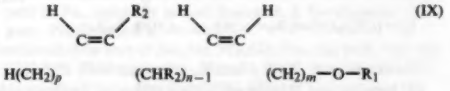
(VII)

wherein p is as set forth above to produce an alcoholate of the formula:



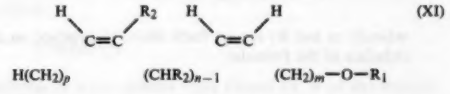
(VIII)

wherein m, n, p, R_1, R_2, R_3 and R_4 are as set forth above; and
(e) heating said alcoholate in an aprotic solvent medium to produce a diene of the formula:



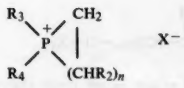
(IX)

wherein m, n, p, R_1, and R_2 are as set forth above.
2. A process for the preparation of a compound of the formula:



(XI)

wherein
m is an integer from 1 to 11,
n is an integer from 1 to 9,
p is an integer from 1 to 6,
R_1 is selected from the group consisting of tetrahydropyranyl, benzyl, trimethylsilyl, t-butyldimethylsilyl and triphenylmethyl;
which process comprises:
(a) contacting a cyclic phosphonium halide of the formula:


(I)

wherein

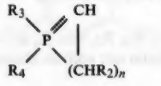
n is as set forth above,

R_2 is selected from the group consisting of hydrogen, and straight and branched chain lower alkyl groups,

R_3 and R_4 are independently selected from the group consisting of phenyl, lower alkyl-substituted phenyl, lower alkoxy-substituted phenyl, and halo substituted phenyl; and

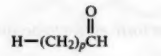
X is a halogen selected from the group consisting of chlorine, bromine, and iodine;

with an alkali metal alkoxide to produce an ylid of the formula:

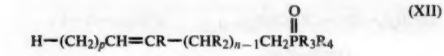

(II)

wherein n, R_2, R_3 and R_4 are as set forth above;

(b) treating said ylid with an aldehyde of the formula

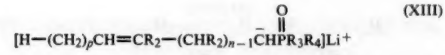

(VII)

wherein p is as set forth above, to produce a phosphine oxide of the formula:


(XII)

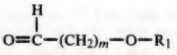
wherein n, p, R_2, R_3 and R_4 are as set forth above;

(c) contacting said phosphine oxide with an organo lithium compound in an aprotic solvent medium to produce a lithium salt of the formula:

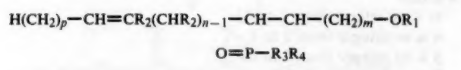

(XIII)

wherein n, p, R_2, R_3, and R_4 are as set forth above;

(d) treating said lithium salt with a protected hydroxy aldehyde of the formula:

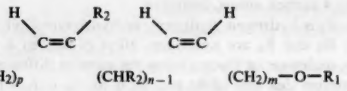

(III)

wherein m and R_1 are set forth above to produce an alcoholate of the formula:


(XIV)

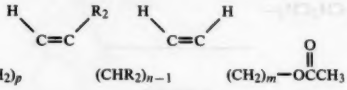
wherein m, n, p, R_1, R_2, R_3 and R_4 are as set forth above; and

(e) heating said alcoholate in an aprotic solvent medium to produce a diene of the formula:


(IX)

wherein m, n, p, R_1, and R_2 are as set forth above.

3. The process of claim **1** or **2** further including the step of converting said diene to its corresponding acetate.


(XI)

7. The process according to claim **1** or **2** wherein Compound IX is produced by replacement of Step (e) by treatment with a water solution in a dipolar aprotic solvent medium and treatment with an alkali or alkaline earth metal hydride.

4,296,043

PROCESS FOR THE PREPARATION OF BENZANTHRONES

Josef Schroeder, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

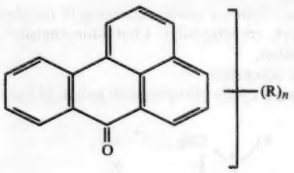
Filed May 17, 1979, Ser. No. 39,790

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823160

Int. Cl.[3] **C07C** *50/22*

U.S. Cl. 260—352 **8 Claims**

1. Process for the preparation of benzanthrone of the formula

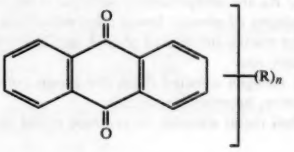

(I)

in which

R designates alkyl or halogen and

n represents 0, 1, 2 or 3,

which comprises contacting an anthraquinone of the formula


(II)

in which

R and n have the meaning indicated above, with acrolein or a compound from which acrolein is formed under the reaction conditions, in the presence of phosphorus or a phosphorus compound having a reducing action, in relatively highly concentrated sulphuric acid at elevated temperature, and working up the reaction mixture to give the benzanthrone of the formula (I).

4,296,044
PROCESS FOR THE PREPARATION OF CATIONIC ANTHRAQUINONE DYESTUFFS

Karl H. Duchardt, and Günter Gehrke, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

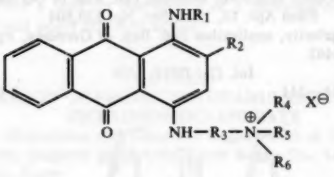
Filed Jan. 31, 1980, Ser. No. 117,170

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906132

Int. Cl.³ C07C *97/25*

U.S. Cl. 260—381 **9 Claims**

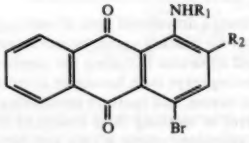
1. In the preparation of cationic anthraquinone dyestuffs of the formula



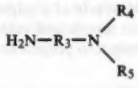
wherein

R_1 denotes hydrogen, alkyl or cycloalkyl,
R_2 denotes hydrogen, alkyl or bromine,
R_3 denotes alkylene,
R_4 and R_5 denote alkyl, aryl or aralkyl,
R_6 denotes alkyl or aralkyl and
$X^{\ominus}$ denotes an anion,

by reacting a 4-bromoanthraquinone of the formula



with amines of the formula



in the presence of proton acceptors and copper salts as a catalyst, and subsequently quaternising the product with compounds of the formula

$$R_6—X$$

without intermediate isolation, the improvement which comprises carrying out the reaction of the 4-bromoanthraquinone with the amine in a solvent mixture consisting of 50–90% of one or more aprotic, non-polar or slightly polar solvents and 10–50% of one or more protic or aprotic, polar solvents, and in the presence of a base which does not precipitate the catalyst so as to trap the acid formed during the reaction.

4,296,045
PROCESS FOR THE PREPARATION OF POLY-(-N-ALKYLIMINOALANES)

Salvatore Cucinella; Alessandro Mazzei, both of San Donato Milanese, and Giovanni Dozzi, Milan, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 601,209, Aug. 1, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,228

Claims priority, application Italy, Aug. 2, 1974, 25941 A/74; Jun. 24, 1975, 24706 A/75

Int. Cl.³ C07F *5/06*

U.S. Cl. 260—448 R **10 Claims**

1. In a process of preparing a poly-(-N-alkyliminoalane) having the composition $(HAlNR)_n$, wherein R represents a member of the group consisting of aliphatic, cycloaliphatic, aromatic and alkylaromatic radicals, and n is a number in the range of 3 to 50, the process comprising reacting metallic aluminum with a primary amine having the formula H_2NR, wherein R has the significance given above, in the presence of hydrogen at a pressure in the range of from 1 to 1000 kg/cm^2 and at least a stoichiometric quantity of said aluminum with respect to the amine, at a temperature in the range of from room temperature to the dissociation temperature of the end product, and in the presence of an initiator composition, the improvement which comprises said initiator composition being present in an amount less than about 5 mole percent with respect to said amine, said initiator composition being selected from the group of initiators consisting of alkaline or earth-alkaline metals and hydrides of aluminum and alkaline or earth-alkaline metals, poly-(-N-alkyliminoalanes) and alkyl aluminum derivatives.

4,296,046
PROCESS FOR THE MANUFACTURE OF ACRYLONITRILE

Robert A. Innes, Monroeville, and William L. Kehl, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 972,933, Dec. 26, 1978, Pat. No. 4,222,899. This application Mar. 31, 1980, Ser. No. 135,523

Int. Cl.³ C07C *120/14*

U.S. Cl. 260—465.3 **10 Claims**

1. A process for preparing acrylonitrile which comprises reacting propylene, ammonia and a gas containing molecular oxygen in contact with a catalyst wherein the atomic ratios of the components thereof are defined by the following empirical formula:

$$USb_aX_bY_cO_d$$

wherein X is an element from Group IV B of the Periodic Table; Y is at least one element selected from the group consisting of molybdenum and vanadium; a is a number falling within the range of about 1.35 to about 2.75; b is a number falling within the range of about 0.25 to about 1.65; and c is a number falling within the range of about 0.05 to about 0.25; d is a number falling within the range of about 8 to about 12; and the sum of a+b is a number falling within the range of about 2.5 to about 3.80 at a temperature in the range of about 375° to about 525° C. and a pressure of about 0 to about 100 pounds per square inch gauge for at least about 0.01 second.

4,296,047

CONTINUOUS PREPARATION OF PHOSPHORIC ACID ALKYL ESTER DICHLORIDES

Karl-Julius Schmidt; Friedrich Schmidt, both of Wuppertal; Peter Siegle, Cologne, all of Fed. Rep. of Germany, and Gert Hansen, Sao Paulo, Brazil, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

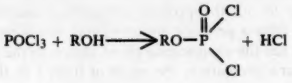
Filed Mar. 12, 1980, Ser. No. 129,852

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911700

Int. Cl.³ C07F 9/14

U.S. Cl. 260—974 7 Claims

1. In the preparation of a phosphoric acid alkyl ester dichloride by reacting phosphorus oxychloride with an aliphatic alcohol according to the equation



in which

R represents C_1–C_5-alkyl,

the improvement which comprises carrying out the reaction continuously at a temperature of about 10° to 50° C. using an excess of phosphorus oxychloride of about 5 to 400%.

4,296,048

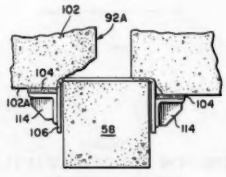
SUPPORT BRACKET FOR DISTRIBUTION PANEL FOR COOLING TOWERS AND THE LIKE

William J. Sim, 4068 Arjay Cir., Ellicott City, Md. 21043, and Ronald M. Marth, 5409 Lucy Dr., Waldorf, Md. 20601

Filed Apr. 1, 1980, Ser. No. 136,390

Int. Cl.³ B01F 3/04

U.S. Cl. 261—111 19 Claims



1. A support bracket for supporting a first beam on a second beam wherein relative movement of one beam with respect to the other beam may cause deterioration of a beam end, comprising a U-shaped strap passed over the underlying beam in inverted supported position thereon and proximate the supported beam, said strap having a supportive angle member with a flange portion being in operative supportive contact with the underside of said supported beam, the supportive engagement permitting a degree of relative movement of one said beam with respect to the other said beam.

16. A hyperbolic cross flow water cooling tower comprising an outer shell open at the top interior, a cooling ring base on said shell, a cool water basin therebelow, said cooling ring including a plurality of radially disposed superposed bent panels having upper beams thereon, a plurality of drip and water dispersing means formed as panels and supported from and suspended from at least some said bent panels, a precast concrete water distribution basin having a base comprised of curvilinear segments of double T-beams adjacently placed, with the bottoms of said T-beams supportedly resting on the said upper beam of the upper ones of said superposed bent panels, said bent panels and beams thereof being of precast concrete, said curvilinear segments having spaced ends supportedly in contact with the upper surface of said upper beam of said upper bent panel, the precast materials and environmental use causing relative movement between said T-beam bottoms and said upper beam, resulting in a wearing away of the ends of said T-beams, and a T-beam supportive bracket including an angle member having a horizontal and a vertical leg, inverted U-shaped straps placed over said said upper beam supporting said T-beams on each opposite side of said angle member, said vertical leg of said angle member being fixedly attached to depending legs of said strap, and integrated therewith, said horizontal leg of said angle member being operatively supportively disposed beneath said spaced ends and serving to permit relative movement of the precast members while limiting abrasive deterioration thereof.

4,296,049

DISTRIBUTOR FOR WASHING FLUID IN A SCRUBBER OR STRIPPER

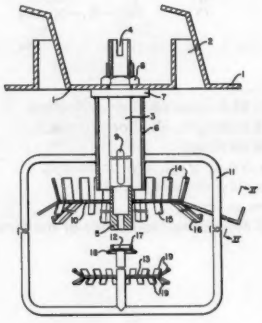
Horst Ritter, Essen, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Apr. 11, 1980, Ser. No. 139,504

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916462

Int. Cl.³ B01F 3/04

U.S. Cl. 261—111 8 Claims



1. Apparatus to distribute a downward flow of washing fluid in a scrubber or a stripper for treating a countercurrent gaseous or vaporous stream, said apparatus including the combination of a plurality of distributing trays each having an aperture for the upward flow of said stream, said aperture terminating at an elevation above the level of washing fluid contained by the tray thereof, a spigot extending above a tray and having a liquid receiving opening between the tray and the aperture thereabove, each spigot extending downwardly from a tray and including a liquid discharge nozzle at a lower end thereof and at least one fluid discharge opening thereabove, means for securing said spigot to a tray, a casing surrounding each spigot in a concentrically-spaced relation, and two fluid distributing members, one disposed underneath said nozzle of a spigot and the other member disposed between the nozzle and said fluid discharge opening on a portion of the spigot to project beyond said casing.

4,296,050

PACKING ELEMENT FOR AN EXCHANGE COLUMN

Werner Meier, Elgg, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Oct. 26, 1977, Ser. No. 845,784

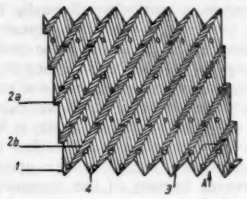
Claims priority, application Switzerland, May 12, 1977, 5948/77

Int. Cl.³ B01F 3/04

U.S. Cl. 261—112 11 Claims

1. A packing element for an exchange column comprising a plurality of corrugated plates of foil-like material disposed in parallel relation, each said plate having corrugations disposed at an angle and in criss-crossing relation to the

corrugations of an adjacent plate, each said plate having a plurality of apertures distributed therein, and each said corrugation of each plate having a laterally extending fine



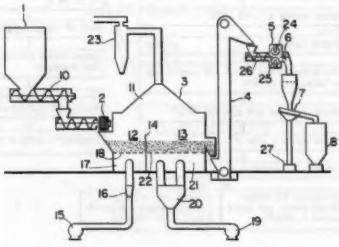
fluting therein whereby said apertures and said fine fluting effect a uniform distribution of a downwardly flowing liquid under capillary action.

4,296,051

METHOD OF PRODUCING GRANULAR SODIUM DICHLOROISOCYANURATE

Tadao Shimamura, and Tadayoshi Kojima, both of Tokushima, Japan, assignors to Shikoku Kasei Kogyo Co., Ltd., Marugame, Japan

Filed Oct. 22, 1979, Ser. No. 87,160
Claims priority, application Japan, Oct. 23, 1978, 53-130724
Int. Cl.³ B02C *4/00*
U.S. Cl. 264—118 **10 Claims**



1. A method of producing granular sodium dichloroisocyanurate comprising the steps of extruding wet sodium dichloroisocyanurate having a moisture content of about 15–30% through a screen with a plurality of openings to form columnar pellets, passing said pellets through a fluidized bed heating chamber to dry said pellets until they contain substantially no free water, compacting said dried pellets to increase their bulk density, crushing said compacted pellets, and screening the crushed pellets to obtain the granular sodium dichloroisocyanurate product.

4,296,052

METHOD OF FABRICATING HELIUM-TIGHT TUBESHEET FOR HOLLOW FIBER TYPE BATTERY CELLS

Joginder N. Anand, Clayton; Timothy T. Revak, Concord, and Floris Y. Tsang, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 12,637, Feb. 16, 1979, Pat. No. 4,219,613.
This application Feb. 14, 1980, Ser. No. 121,357
Int. Cl.³ H05B *1/00*
U.S. Cl. 264—25 **6 Claims**

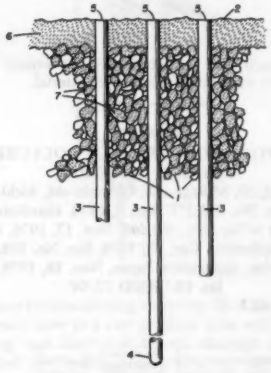
1. A process for making a helium-tight, tubesheet/hollow fiber assembly comprising a ceramic tubesheet which has first and second generally opposed faces and is pierced by a plurality of inorganic hollow fibers having closed-ended sections extending from said first face and open ends terminating in or beyond said second face,

the portion of said tubesheet subjacent to and defining said second face being non-porous and sealingly engaged with the fibers,

the remainder of the tubesheet being contiguous with said portion but not itself sealingly engaged with the fibers, and consisting essentially of sintered, ceramic particles having the same chemical composition as said portion;

said process comprising:

(a) providing a self-supporting, sintered, ceramic particle mass which has two generally opposed surfaces and is pierced by and adhered to said fibers, the closed-ended sections of which extend from one of said surfaces and the open ends of which terminate in or beyond said other surface,



the particles constituting said mass consisting of a material which

(1) has a coefficient of thermal expansion not differing from the coefficient for the fiber material by more than 20×10^{-7} per °C.,

(2) is fusible, at a temperature below the softening point of the fibers, to a melt capable of bonding with them, and

(3) has a sufficiently low thermal conductivity so that the portion of said mass subjacent to and defining said other surface can be locally heated to said temperature and melted without causing the rest of said mass to lose its sintered, particulate structure,

(b) so heating to said temperature said portion of said mass, and

(c) cooling the so-heated mass to solidify the resulting layer of molten ceramic,

thereby forming said helium-tight assembly.

4,296,053

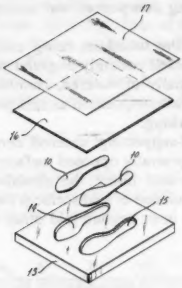
METHOD OF MAKING FOAMED PLASTISOL INSOLES FOR SHOES

Daniel M. Doerer, Chesterfield, and Lloyd E. Brunkhorst, Florissant, both of Mo., assignors to Brown Group, Inc., St. Louis, Mo.

Filed May 24, 1979, Ser. No. 42,197
Int. Cl.³ B29D *27/04*
U.S. Cl. 264—26 **8 Claims**

1. A process for molding insoles for footwear comprising: forming a mold cavity having a predetermined shape and surface texture; metering and depositing a foamable liquid vinyl material into the mold cavity; freely floating a stabilizing ply on the liquid vinyl material in the mold cavity; closing the mold cavity with a pressure applying head; placing gas release means between the foamable liquid vinyl material in the cavity and the head to release gaseous media and to prevent adhesion of the vinyl material to the head; applying a high frequency reversing AC field for agitating the foamable liquid vinyl

material into fusing and expanding to fill the mold cavity; and providing a reservoir for air and gas passing through the release means such that the mold cavity is vented during the agitating of the foamable liquid vinyl material.



4,296,054

METHOD FOR PRODUCTION OF POLYURETHANE CUSHION MATERIAL

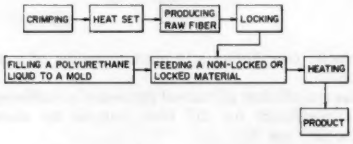
Sadaaki Takagi, 39, Mikage-cho, Okazaki-shi, Aichi-ken, Japan

Division of Ser. No. 893,277, Apr. 5, 1978, abandoned, which is a continuation of Ser. No. 742,568, Nov. 17, 1976, abandoned. This application Dec. 31, 1979, Ser. No. 108,556

Claims priority, application Japan, Nov. 18, 1975, 50-138520

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—45.3 **9 Claims**



1. A method for production of a polyurethane cushion material comprising crimping a strand of large denier of a fiber filament by twisting the strand in a single twist and then further twisting it in the same direction to yield a double-twisted strand, setting it while double-twisted by wet heating, loosening the double-twisted, heat-set strand, and cutting it into staple lengths, and opening the cut staple lengths to form a three-oriented, crimped fiber filament, filling a mold with a mass of staple fiber thus formed together with polyurethane foam-forming components, foaming the polyurethane components, and post-curing the foam to complete polycondensation.

4,296,055

METHOD OF INJECTION MOLDING THERMOPLASTIC RESINOUS PRODUCTS SUBSTANTIALLY FREE FROM SINK MARKS, SWIRLS AND RELATED BLEMISHES

Wilford D. Harris, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 839,055, Oct. 3, 1977, abandoned, which is a continuation of Ser. No. 679,638, Apr. 22, 1976, abandoned. This application Feb. 7, 1979, Ser. No. 10,188

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—45.5 **5 Claims**

1. In a method for the injection molding of synthetic resinous thermoplastic injection moldable compositions, the method comprising providing a heat-plastified synthetic resinous composition, injecting the heat-plastified composition into a mold cavity to fill the cavity, the mold cavity having walls below the thermoplastic temperature of the composition, cooling the composition within the mold configuration until it is at least self-supporting and removing the compositions from the mold, the improvement which comprises modifying said heat-plastified resinous composition by incorporating within the composition and in intimate admixture therewith a volatile fluid foaming agent, a particulate thermally decomposable blowing agent, the foaming agent being present in quantity sufficient to provide cell formation in the molded part and sufficient to compensate for shrinkage during cooling, a finely divided nucleating or cell inducing agent and providing a gas under pressure within the mold cavity sufficient to prevent foaming of the composition until the cavity is filled with the resinous composition, injecting said modified heat-plastified composition into said cavity, under said gas pressurized conditions which prevent foaming of the composition until the cavity is filled with the resinous composition whereby a molding substantially free from sink marks, swirls and related blemishes is obtained.

4,296,056

METHOD FOR PREPARING A FILTER MEDIUM

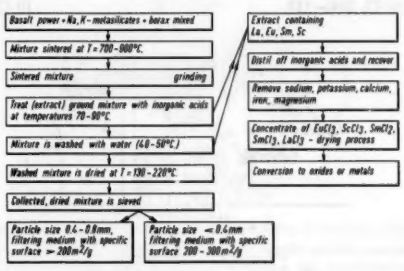
Alois J. Bumbalek, Hanover-Kleefeld, Fed. Rep. of Germany, assignor to Hermann Wegener Schiffgraben, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 23,832

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1978, 2817176

Int. Cl.³ B29H *7/20*

U.S. Cl. 264—49 **8 Claims**


Basalt powder + Na, K - metasilicates + borax mixed
Mixture sintered at T = 700 - 900°C.
Sintered mixture
grinding
Treat (extract) ground mixture with inorganic acids at temperatures 70 - 90°C
Mixture is washed with water (40 - 50°C.)
Washed mixture is dried at T = 130 - 220°C.
Collected, dried mixture is sieved
Particle size 0.4 - 0.8mm, filtering medium with specific surface ≥ 200m²/g
Particle size ≤ 0.4mm filtering medium with specific surface 200 - 300m²/g
Extract containing La, Eu, Sm, Sc
Distil off inorganic acids and recover
Remove sodium, potassium, calcium, iron, magnesium
Concentrate of EuCl3, ScCl3, SmCl2, SmCl3, LaCl3 - drying process
Conversion to oxides or metals

1. A method for making a particulate filtering medium which comprises

(a) admixing a powder having a particle size not exceeding 70 microns, selected from the group consisting of basalt and lava, with borax and a metasilicate selected from the group consisting of sodium metasilicate and potassium metasilicate,

(b) sintering the mixture at a temperature between 700° and 900° C.,

(c) grinding the sintered product,

(d) treating the ground product with an inorganic acid,

(e) washing the acid-treated product with water, to increase the specific surface area thereof and

(f) drying the washed product to produce a particulate filter medium having a specific surface area in excess of 200 m^2/g.

4,296,057

METHOD OF MAKING ALUMINA FIBERS

William C. Ziegenhain, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 142,587, Apr. 21, 1980. This application Sep. 2, 1980, Ser. No. 182,878

Int. Cl.³ C04B *35/64*

U.S. Cl. 264—63 **3 Claims**

1. A method for preparing alumina fibers comprising

(a) reacting aluminum alkoxides containing from 2 to about

30 carbon atoms with methanol at a temperature of from about 130° F. to about 450° F. to form solid aluminum methoxide and alcohols.

(b) recovering solid aluminum methoxide from the reaction mixture of (a), washing with methanol to remove higher alcohols, then

(c) reacting the aluminum methoxide with aqueous HCl containing from about 5 to about 15% by weight hydrochloric acid at relux temperature of the solution for a time sufficient to convert substantially all aluminum methoxide to aluminum chlorohydrate in aqueous solution with methanol, then

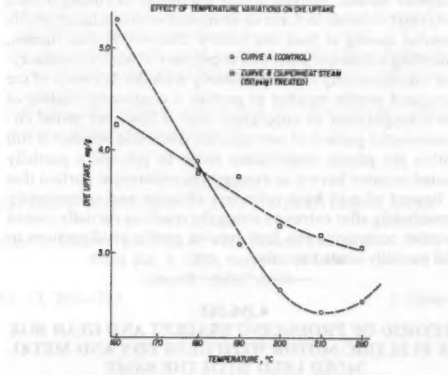
(d) concentrating the aluminum chlorohydrate solution by removing methanol and sufficient water to a viscosity suitable for drawing fibers, then

(e) drawing fibers from the concentrated solution.

4,296,058
PROCESS FOR ENHANCING THE UNIFORMITY OF DYE UPTAKE OF FALSE TWIST TEXTURIZED POLYETHYLENE TEREPHTHALATE FIBROUS MATERIALS

John C. Chen, North Plainfield, and Herbert L. Davis, Convent Station, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,662
Int. Cl.³ D01F *1/04*
U.S. Cl. 264—78 **18 Claims**



1. In a process for providing a dyed, false twist texturized fibrous material comprising at least 85 mole percent polyethylene terephthalate which is subject to variations in dye uptake induced by a false twist texturizing treatment conducted on said fibrous material prior to or concurrently with a dyeing process, the improvement which comprises enhancing the uniformity of dye uptake of said fibrous material by:

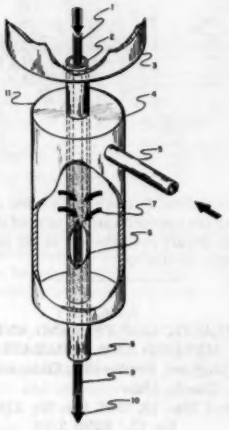
(a) providing a fibrous material comprising at least 85 mole percent polyethylene terephthalate having a birefringence of at least 0.1 prior to said false twist texturizing treatment; and,

(b) annealing said fibrous material of (a) at a temperature of about 120° to about 160° C. while controlling the length thereof in a manner sufficient to prevent a longitudinal shrinkage greater than about 10% and a longitudinal extension greater than about 5% based on the original length of the fibrous material prior to annealing, for a period of about 0.01 to about 1 second.

4,296,059
PRESSURE SEALING PROCESS

Francesco DeMaria, Gulf Breeze, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 938,203, Aug. 30, 1978, abandoned. This application Jul. 20, 1979, Ser. No. 59,928
Int. Cl.³ B29H *21/04*
U.S. Cl. 264—130 **3 Claims**



1. A process for transferring a moving fiber tow bundle from a high pressure zone to a low pressure zone which comprises:

(a) passing said fiber tow bundle through a passageway contained in a sealing zone which provides liquid water under pressure thereto, said sealing zone being located between said high pressure zone and said low pressure zone, said passageway being confined and elongated and having a continuous longitudinal surface adapted to receive a coating of liquid water under pressure thereon by diffusion therethrough of liquid water under pressure from said sealing zone, and said passing being conducted while said coating of liquid water is continuously diffused onto said passageway surface so that said water coating and said fiber tow bundle cooperate to produce an effective pressure seal within the length and confines of said passageway and said water coating prevents contact of said fiber tow bundle with said passageway surface; and

(b) receiving said fiber tow bundle in said low pressure zone.

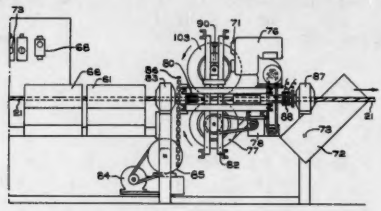
4,296,060
METHOD OF PRODUCING A PULTRUDED, FIBER REINFORCED ROD

Charles W. Killmeyer, deceased, late of Braddock Hills, Pa.; by Elizabeth A. Killmeyer, administrator, Pittsburgh, Pa.; James E. Lane, Henrietta, N.C.; Leslie L. Taylor, Jr., Forest City, N.C., and Joe T. Pearson, Lawndale, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 101,990, Dec. 7, 1979. This application Jul. 7, 1980, Ser. No. 166,522
Int. Cl.³ B29D *1/00*
U.S. Cl. 264—137 **7 Claims**

1. An improved method of producing a pultruded, fiber reinforced, resinous rod comprising coating glass fiber continuous strands with resin, pulling the resin-coated continuous glass fiber strands through a shaping zone to provide a rod structure having at least one protrusion on the surface containing resin-coated continuous glass fiber strands, at least partially curing the resin-coated continuous glass fiber strands, passing the at least partially-cured rod through a second zone, rotating the at least partially-cured rod in said second zone relative to said first zone to form a solid rod in which at least a portion of

the continuous glass fiber strands follow the contour of at least one protrusion of the rod through the two zones and completely curing the rod; wherein the improvement comprises pulling the rod by rotating opposed surfaces against the rod



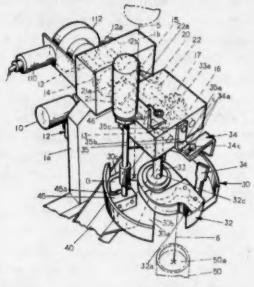
surface to move the rod through said second zone and simultaneously moving the opposed surface around the axis of the rod continuously to impart twist thereto as the surfaces are exerting pulling forces on the rod.

4,296,061

THERMOPLASTIC GOB FEEDING AND TRANSFER METHOD AND APPARATUS

James W. Buckingham, Pemberville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 19, 1980, Ser. No. 131,712
Int. Cl.³ B29B 5/06
U.S. Cl. 264—138 **9 Claims**



2. The method of feeding successive free falling gobs of heated thermoplastic material to successive molding cavities, comprising the steps of:

(1) intercepting the free fall of each gob with a continuously horizontally moving transfer surface:

(2) moving each gob solely by the movement of the transfer surface to a position horizontally spaced from its free fall path, and

(3) deflecting each successive gob from the moving transfer surface into a molding cavity positioned below the transfer surface.

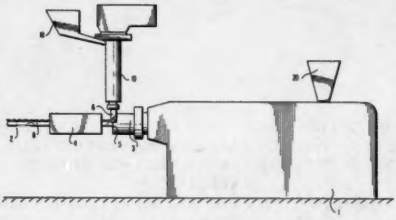
5. A gob feeding mechanism for converting a continuously extruded rod-like formation of heated thermoplastic material into a series of identical weight gobs and delivering the gobs respectively to molding members, comprising, in combination, shearing means periodically contacting the thermoplastic formation to shear freely falling gobs therefrom, a transfer plate mounted beneath the shear members, means mounting said transfer plate for continuous horizontal movement intersecting the free fall path of the gobs so that a portion of the transfer plate will periodically receive a falling gob thereon, a plurality of molding members each having an open top molding cavity, means for moving said molding members successively beneath the path of movement of said transfer plate and in timed relationship to the movement thereof, and means for deflecting each gob on said transfer plate to fall into the open top molding cavity of a molding member passing beneath the transfer plate.

4,296,062

PROCESS FOR THE EXTRUSION OF COATED SKEIN-SHAPED PROFILES, PREFERABLY OF THERMOPLASTIC SYNTHETIC RESINS

Peter Gauchel, Alzenbach, and Waldemar Wissinger, Siegburg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 399,982, Sep. 24, 1973, Pat. No. 4,204,821.
This application Jul. 26, 1978, Ser. No. 927,985
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1972, 2246679
Int. Cl.³ B29F 3/10
U.S. Cl. 264—173 **12 Claims**



1. A continuous process for the extrusion and sizing of an elongated multi-surfaced profile member for use as a structural component in the building industry having at least one hollow chamber formed therein, which comprises extruding a hard polyvinyl chloride to form an elongated multi-surfaced profile member having at least one hollow chamber formed therein, extruding a homopolymer or a copolymer of methyl methacrylate simultaneously and continuously with the extrusion of the elongated profile member to provide a continuous coating of the homopolymer or copolymer onto at least one partial circumferential portion of said member while said member is still within the plastic temperature range to provide a partially coated member having an exposed circumferential portion that is formed of said hard polyvinyl chloride and subsequently immediately after extrusion sizing the resulting partially coated member to provide the final precise profile configuration to said partially coated member.

4,296,063

METHOD OF PRODUCING BRACKET AND GEAR BOX OF ELECTRIC MOTOR WITH GEAR BOX AND METAL MOLD USED WITH THE SAME

Masaaki Sendo, and Kinzo Suzuki, both of Nakatsugawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 75,209
Int. Cl.³ B29F 1/10
U.S. Cl. 264—273 **10 Claims**

1. A method for producing an integral unit including a metal bracket having attached thereto a gear box formed of synthetic resinous material, said unit being of the type to be used in an electric motor, said method comprising:

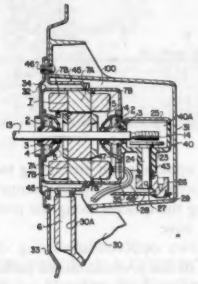
providing a plate metal bracket;

providing a composite metal mold including a stationary mold member, a first movable mold member and a second movable mold member;

moving said first and second movable mold members relative to each other and to said stationary mold member to a mold open position providing an open space between said first movable mold member and said second movable mold member;

positioning said plate metal bracket on one of said movable mold members within said open space;

moving said first movable mold member in a first direction toward said stationary mold member while guiding said first movable mold member along a first guide means extending in said first direction, and moving said second movable mold member, in a second direction inclined to said first direction, toward both said first movable mold member and said stationary mold member while guiding said second movable mold member along a second guide means extending in said second direction and along a third guide means extending transverse to said first direction, to



thereby move said movable mold members to a mold closed position closing said open space and providing predetermined spacings between said plate metal bracket and said mold members;

introducing synthetic resinous material into said predetermined spacings, and thereby forming a gear box integrally connected to said plate metal bracket as a unit;

moving said movable mold members in directions opposite to said first and second directions to said mold open position; and

removing said integral unit of said gear box and said plate metal bracket from said mold.

4,296,064

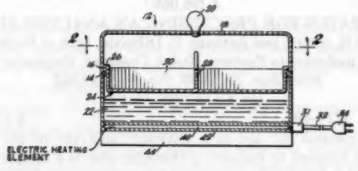
METHOD AND STRUCTURE FOR RECYCLING SOAP CHIPS

Angel T. Satcher, 164 NE. 82 Ter., Miami, Fla. 33138

Filed Jul. 3, 1980, Ser. No. 165,604

Int. Cl.³ B29C *1/00*

U.S. Cl. 264—322 **1 Claim**



1. A method of recycling soap chips wherein a container is utilized which comprises, an inwardly offset upper rim, the container including a floor, a space between the floor and the rim adapted to receive a charge of water therein, electrical heating means adjacent the container floor for heating the water in the container space, and separate rack including two septums perpendicular to one another, dividing the rack into four compartments; the rack compatibly mating with and suspended by the offset upper rim a predetermined distance above the water, the method comprising:

gathering chips of soap;

placing chips of soap into each of the compartments;

activating electrical heating means for heating water in container space;

melting the soap chips;

deactivating the heating means;

cooling the rack;

removing the rack from the container; and turning the rack over, emptying formed soap bars.

4,296,065

METHOD OF PRODUCING HIGHLY DENSIFIED CERAMIC ARTICLES

Takashi Ishii, Tokyo; Katsutoshi Nishida, Yokohama; Michiyasu Komatsu, Yokohama, and Akihiko Tsuge, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 13, 1976, Ser. No. 685,980

Claims priority, application Japan, May 14, 1975, 50-55954

Int. Cl.³ C04B *35/58*

U.S. Cl. 264—325 **3 Claims**

1. A method of producing ceramic articles of complicated shape having a density substantially equal to the theoretical density, said articles having a surface roughness Rmax of from 3μ to 7μ and substantially no deformed portion, which method comprises:

forming a preliminary molding by injection molding a powdered ceramic material selected from the group consisting of carbides, oxides and nitrides of W, Zr, Si, Al, Ta, Nb, B, V, Hf, Mo, Cr and mixtures thereof, said preliminary molding having a porosity of 30 to 70% with a uniform pore distrubition;

heating said preliminary molding at a temperature of from 1550° C. to 1900° C. to obtain a preliminarily sintered molding of a porosity below 30 percent;

embedding said preliminarily sintered molding in a pressure transmitting powder which is nonreactive and nonfusible under the conditions of the subsequent sintering; and

applying pressure to the pressure transmitting powder at a sintering temperature so as to compress uniformly the preliminarily sintered molding and remove the pores present in the molding.

4,296,066

MULTICHAMBER PHOTOREACTOR

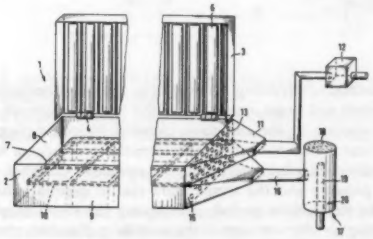
Günther Schenck, Bismarckstrasse 31, 4330 Mülheim-Ruhr, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 923,710, Jul. 11, 1978, Pat. No. 4,255,383. This application Jan. 28, 1980, Ser. No. 115,657

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904242

Int. Cl.³ A61L *2/10, 2/16, 2/24*

U.S. Cl. 422—24 **49 Claims**



19. A process for purifying a fluid medium with a predetermined minimum radiation dose of ultraviolet radiation wherein, at a given location, a number n, less than four, of series connected flow paths to be passed consecutively by said medium are provided in juxtaposition to each other and the incident ultraviolet radiation is first introduced into one of said

paths and permitted to escape from said path into other of said paths, in which process the relationship between the irradiation intensities effective in each one of said flow paths and the total rate of flow of the medium through all said flow paths is established so that the sum of the fractional doses applied to the medium being passed through each one of said series connected flow paths equals said predetermined minimum radiation dose applied to the medium when it has passed consecutively through all said flow paths, said process being characterized by:

two of the flow paths provided in juxtaposition to each other having a depth ratio in the range of about 0.34 to about 0.47, said depth ratio being defined by the depth of the smaller one of said two flow paths divided by the sum of the depths of said two flow paths, and

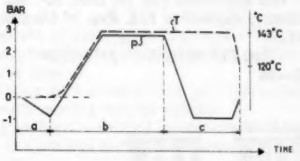
the relationship between the irradiation intensity, the character of the medium and the sum of the depths of the medium in said two flow paths being established so that the total radiation absorbed by the medium in both said two flow paths does not exceed 90 percent of the incident radiation.

4,296,067

METHOD OF STERILIZING MATERIAL, ESPECIALLY BANDAGE AND SURGICAL INSTRUMENTS, IN AN AUTOCLAVE OPERATING WITH VACUUM AND STEAM

John O. Näsman, Rapphönsvägen 15,, 122 39 Enskede, and Carl-Erik Högfeldt, Tideliusgatan 56, 116 69 Stockholm, both of Sweden

Filed Jan. 30, 1980, Ser. No. 116,843
Claims priority, application Sweden, Jan. 30, 1979, 7900813
Int. Cl.³ A61L *2/06*
U.S. Cl. 422—26 **3 Claims**



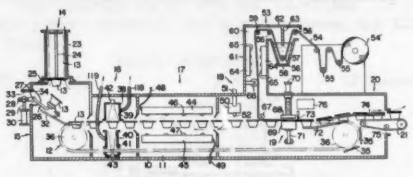
1. A method of sterilizing material in an autoclave operating with vacuum and steam, consisting of the steps in sequence of creating vacuum in the autoclave chamber by connecting a vacuum source thereto until a predetermined pre-vacuum has been obtained, supplying steam to the autoclave chamber so that the pressure and the temperature rise to desired values during the sterilization period, interrupting the steam supply and creating an after-vacuum in the autoclave chamber, characterized in that during substantially the entire after-vacuum period the sterilization temperature prevailing in the autoclave chamber at the beginning of the after-vacuum period is maintained substantially constant by supplying dry heat in the chamber from a separate dry heat source and at the termination of the after-vacuum period, and as the vacuum is permitted to terminate, lowering the temperature slightly.

4,296,068

APPARATUS FOR STERILIZING A SUCCESSION OF FOOD CONTAINERS OR THE LIKE

Masaru Hoshino, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1980, Ser. No. 121,730
Claims priority, application Japan, Feb. 19, 1979, 54-17987; Jul. 31, 1979, 54-105847[U]; Aug. 8, 1979, 54-101036; Sep. 21, 1979, 54-121675
Int. Cl.³ B08B *3/12, 7/04*
U.S. Cl. 422—62 **26 Claims**



21. A sterilizing apparatus for sterilizing successive articles being fed along a predetermined path, comprising:

means for feeding the articles along the predetermined path at least in one row;

means defining two opposed sterilizing chambers on the opposite sides of the predetermined path;

means for supplying a sterilized liquid as a fine spray into the sterilizing chambers, whereby the successive articles traveling between the sterilizing chambers are sterilized;

means for heating the sterilizing chambers and the supplying means;

a light source for emitting a beam of light across at least one of the two opposing sterilizing chambers;

means for receiving the light beam and generating electrical output representative of the density of the droplets of the sterilizing liquid in the sterilizing chambers;

integrator means for integrating the output from the receiving and generating means during each of the successive prescribed period of time; and

comparative means for comparing the output from the integrator means with a predetermined reference representative of the intergral, during one of the prescribed periods of time, of the output from the receiving and generating means in the case where a desired amount of the finely sprayed sterilizing liquid is supplied into the sterilizing chamber.

4,296,069

APPARATUS FOR PROCESSING AN ANALYSIS SLIDE

Michael R. Smith, and Anthony P. DiFulvio, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,562
Int. Cl.³ G01N *35/04*
U.S. Cl. 422—64 **6 Claims**

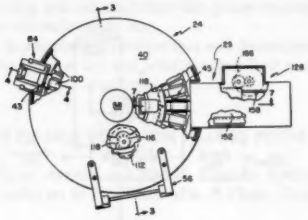
1. Apparatus for use in a chemical analyzer of the type which is adapted to measure a characteristic of a sample fluid deposited on an analysis slide, said apparatus comprising:

incubator means including a temperature-controlled chamber having a transfer location at which an analysis slide may be transferred into or out of said chamber and conveyor means for supporting a plurality of slides in said chamber and selectively moving each of the analysis slides to and from said transfer location;

means defining a read station wherein said characteristic can be measured; and

slide transfer means for moving an analysis slide along a slide path extending between said incubator means and said read station, said slide transfer means including diverter means selectively conditionable in (1) a first condition wherein an analysis slide can be freely moved by said slide

transfer means along said slide path and (2) a second condition wherein an analysis a slide being moved along



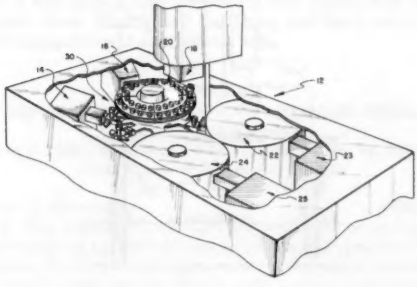
said slide path by said slide transfer means is diverted from said slide path.

4,296,070

SLIDE DISTRIBUTOR FOR A CHEMICAL ANALYZER

Michael S. Montalto; Douglass L. Blanding, and Michael R. Smith, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,564
Int. Cl.³ G01N *35/04*
U.S. Cl. 422—65 **14 Claims**



1. Apparatus for use in measuring a characteristic of a sample fluid wherein the fluid is deposited on an analysis slide which is analyzed after an appropriate period of time, said apparatus comprising:

a plurality of apparatus elements, said elements being arranged in a preselected sequence along a path traveled by said slide in said apparatus, said elements including slide supply means, metering means for depositing a predetermined quantity of sample on a slide supported in a metering position, and incubator means;

slide transfer means for moving a slide from said slide supply means along said slide path and for delivering a slide to a selected one of said elements;

drive means for moving said slide transfer means through a series of slide advance cycles; and

locating means engageable with said slide transfer means for precisely positioning said slide transfer means and a slide therein relative to each of said elements after each advance cycle to facilitate the processing of the slides and the transfer of slides between said elements and said transfer means.

4,296,071

PIPETTE WITH ELASTIC BELLOWS

Erich Weiss, Mannheim-Sandhofen, and Dieter Ungermann, Mannheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim, Mannheim-Waldhop, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 94,134.
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851532
Int. Cl.³ B01L *3/02*; G01N *1/14*; A61M *1/00*
U.S. Cl. 73—864.11 **8 Claims**

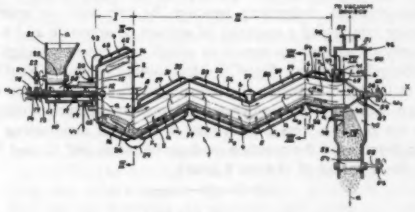
1. A pipette comprising: an elongated casing; an elastic bellows disposed in the casing with one end thereof fixed to the casing; and means mounting the other end of the bellows for longitudinal movement relative to the casing from a rest position to a predetermined compressed position and wherein the bellows is prestressed over the entire range of travel between the rest and compressed positions and has sufficient elasticity to return to the rest position unaided, the mounting means comprising stop means forming two separate stops limiting movement of the other end of the bellows wherein one stop defines the rest position and the other stop defines the compressed position.

4,296,072

APPARATUS FOR THE TREATMENT OF WET SOLIDS, ESPECIALLY PULPY MATERIALS, BY HEATING OR COOLING

Istvan Takacs; Zoltan Banos; Janos Illes; Endre Vereczkey; Peter Rudolf, and György Kerey, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar, Budapest, Hungary

Filed Mar. 19, 1980, Ser. No. 131,825
Claims priority, application Hungary, Mar. 21, 1979, RI 702
Int. Cl.³ B01D *1/14, 9/02, 9/04, 11/00*
U.S. Cl. 422—254 **10 Claims**



1. An apparatus for treatment of wet solids, especially pulpy organic materials comprising:

a hollow treating body rotatable about a horizontal axis;

means for feeding the material to be treated into said treating body;

means for discharging the treated material from said treating body; and

means for controlling the temperature of said treating body, said treating body comprising:

a treating drum centered on said horizontal axis and communicating thereat with said feeding means, said drum having a polygonal cross section defined by an axially flared peripheral wall formed by a plurality of planar panels, each having a pair of nonparallel opposing edges, said peripheral wall being flanked by first and second polygonal end walls of different size centered on said horizontal

axis and perpendicular thereto, said first and second end walls being connected at corresponding edges to said peripheral wall,

a first duct having a polygonal cross section communicating with said drum at a location wholly offset from said horizontal axis and having a first longitudinal axis forming an angle therewith,

a second duct having a polygonal cross section communicating with said first duct at said horizontal axis and having a secong longitudinal axis forming an angle therewith, said first and second longitudinal axes intersecting on said horizontal axis,

a third duct having a polygonal cross section communicating with said second duct at a location wholly offset from said horizontal axis and having a third longitudinal axis forming an angle therewith, and

a fourth duct having a polygonal cross section communicating with said third duct at said horizontal axis and having a fourth longitudinal axis forming an angle therewith, said third and fourth longitudinal axes intersecting at a location offset from said horizontal axis, said fourth duct having an outlet centered on said horizontal axis and communicating with the discharge means, said first, second, third and fourth ducts having substantially the same cross sectional area.

4,296,073

HIGH TEMPERATURE ATTACK OF ORES BY MEANS OF A LIQUOR ESSENTIALLY CONTAINING A SOLUBLE BICARBONATE

Pierre Maurel; Francois Nicolas, both of Aix-en-Provence, and Bernard Bosca, Gardanne, all of France, assignors to Aluminum Pechiney, Lyons, France

Filed Jan. 31, 1979, Ser. No. 7,920
Claims priority, application France, Sep. 2, 1978, 78 04468
Int. Cl.[3] C01G *43/00*
U.S. Cl. 423—3 **13 Claims**

1. In a process for the oxidizing attack at high temperature of ores containing at least one metal from the group formed by uranium, vanadium and molybdenum, by means of an aqueous liquor containing sodium bicarbonate and sodium carbonate in the presence of free oxygen blown into the reaction medium, the separation of the sterile fractions and the liquor emanating from the attack containing the dissolved metal or metals, the improvement comprising treating the ore with an aqueous liquor containing a majority of sodium bicarbonate and a minority of sodium carbonate in which the ratio by weight of sodium bicarbonate ($NaHCO_3$) to sodium carbonate (Na_2CO_3) is at least 1.5, injecting the free oxygen into the reaction medium while in a reaction vessel to provide a pressure of oxygen in the reaction vessel of at least 5 bars and maintaining the temperature of the reaction medium between 160° C. and 300° C. for a period of at most 6 hours.

4,296,074

METHOD OF DECLADDING

Samuel J. Yosim, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

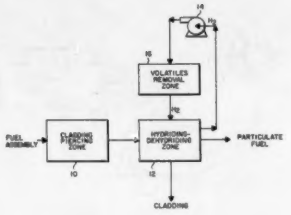
Filed Apr. 10, 1978, Ser. No. 894,678
Int. Cl.[3] G21C *19/34*
U.S. Cl. 423—4 **6 Claims**

1. A method of decladding an assembly comprising an element selected from the group consisting of uranium, thorium and mixtures thereof, clad in stainless steel, zirconium or a zirconium alloy consisting essentially of zirconium and containing minor amounts of nickel, chromium, tin, iron and combinations thereof; said method comprising:

perforating the cladding material to expose the selected element;

reacting said selected element with hydrogen at a temperature of from 450° C. to 680° C. and a hydrogen pressure of from 360 to 1400 torr for a time sufficient to form a hydride of substantially all of the selected element;

increasing the temperature to a range of from about 700° C. to 900° C. to dehydride the selected element to reduce it back to its elemental form;



separating the cladding material from the selected element; and

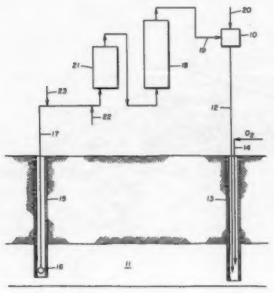
recovering the selected element in a friable particulate readily comminutable form.

4,296,075

METHOD FOR PROTECTING AN ION-EXCHANGE RESIN FROM CHEMICAL POISONING

Tsoung-yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 24, 1978, Ser. No. 963,661
Int. Cl.[3] C01G *43/00*
U.S. Cl. 423—7 **7 Claims**



1. A method for protecting an ion-exchange resin used for adsorbing uranium and/or related values from a leach solution from poisoning caused by polythionates in the leach solution, the method comprising:

passing the leach solution through a catalytic material before passing the leach solution through said resin, said catalytic material converting said polythionates in the leach solution into non-poisoning thiosulfates, sulfites, and water.

4,296,076

CHROMIC OXIDE PRODUCTION

Danvers A. Swales, and Michael A. Marshall, both of Darlington, England, assignors to British Chrome & Chemicals Ltd., Stockton-on Tees, England

Continuation-in-part of Ser. No. 3,333, Jan. 15, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,713
Int. Cl.[3] C01G *37/033*
U.S. Cl. 423—53 **18 Claims**

1. A process for the preparation of chromic oxide having a water insoluble sulphur content of below about 40 ppm, which comprises calcining a solid product feed material at a tempera-

ture ranging from above 1100° to 1600° C. for a time period of from about 10 minutes to 10 hours, said solid product containing at least 60 ppm water insoluble sulphur and from 0.1 to 50% by weight of water soluble material (based on chromic oxide), and optionally containing materials that will volatise during calcining, and selected from the group consisting of

(a) impure chromic oxide, and

(b) a heat decomposable product that will decompose during calcining to form the said solid product feed material.

4,296,077

RECOVERY OF MOLYBDENUM VALUES FROM LEACH MUDS

Steven R. Heuer, Arvada, and Zdenka Zbranek, Littleton, both of Colo., assignors to Engelhard Min. & Chem. Corp., Iselin, N.J.

Filed Nov. 10, 1980, Ser. No. 205,843
Int. Cl.³ C01G *39/00*
U.S. Cl. 423—53 **4 Claims**

1. In a process for the recovery of molybdenum values from molybdenite concentrates wherein the molybdenite concentrate is roasted in the presence of air to convert molybdenum sulfide to molybdenum trioxide and the resulting concentrate containing molybdenum trioxide leached with an aqueous alkaline solution whereby soluble molybdenum salts are extracted therefrom and dissolved in the leach solution and the insoluble solid leach mud separated from the leach solution, the improvement which comprises repulping the leach mud with an aqueous ammonia solution under pressure with an oxygen-containing gas, at a temperature in the range of about 50° to 150° C. for at least about 2 hours, separating residual undissolved solids from said aqueous ammonia solution, repulping said undissolved solids with an aqueous caustic leach solution at a temperature in the range of about 50° to 150° C. for at least about 2 hours, separating solid residue from said caustic leach solution, and recovering said leach solutions containing dissolved molybdenum salts.

4,296,078

SEPARATION OF HYDROGEN CHLORIDE FROM GASEOUS MIXTURES

Cyril B. Tellis, 818 Beaumont Rd., Charleston, W. Va. 25314

Filed Oct. 7, 1980, Ser. No. 194,775
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—240 **3 Claims**

1. The method for the selective separation of hydrogen chloride from a gaseous mixture containing hydrogen chloride, carbon dioxide and other gaseous impurities which comprises contacting said gaseous mixture with a cross-linked, water-insoluble polymer of N-glycidylpiperazine at a temperature between about −10° and 100° C.

4,296,079

METHOD OF MANUFACTURING ALUMINUM SULFATE FROM FLUE GAS

H. William Hauser, Marietta, Ga., assignor to Vinings Chemical Company, Atlanta, Ga.

Continuation of Ser. No. 877,038, Feb. 10, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,772
Int. Cl.³ C01B *17/00*
U.S. Cl. 423—242 **9 Claims**

1. A continuous process for removing sulfur dioxide from sulfur dioxide containing flue gas which comprises:

(a) Continuously contacting an aqueous solution, at a temperature of from 40° to 70° C., containing from 1 to 15 percent by weight sodium aluminate and having a pH between 2 and 10 with a sulfur dioxide containing flue gas at a ratio of between 0.20 and 2 mols of sodium aluminate per mol of sulfur dioxide in a gas-liquid contacting device so that at least a substantial portion of the sulfur dioxide in the flue gas is absorbed into the aqueous solution where it reacts with sodium aluminate to produce sodium sulfite and aluminum hydroxy sulfite;

(b) Transporting the aqueous solution of sodium sulfite and aluminum hydroxy sulfite to a solid-liquid separator and adjusting the pH and temperature of the solution until the aluminum hydroxy sulfite forms an insoluble precipitate, which is then separated from the solution by suitable separating means; and

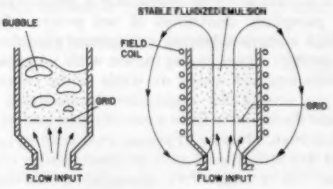
(c) Transporting the aluminum hydroxy sulfite precipitate to an oxidizing reactor where water is added to form a slurry which is maintained at a temperature of from 60° to 90° C. and an oxidizing agent is used to oxidize the aluminum hydroxy sulfite to aluminum sulfate which is then separated from the slurry by suitable separating means.

4,296,080

PROCESS FOR THE REMOVAL OF PARTICULATES ENTRAINED IN A FLUID USING A MAGNETICALLY STABILIZED FLUIDIZED BED

Ronald E. Rosensweig, Summit, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 786,613, Apr. 11, 1977, Pat. No. 4,115,927, which is a continuation-in-part of Ser. No. 610,071, Sep. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 514,003, Oct. 11, 1974, abandoned. This application Aug. 21, 1978, Ser. No. 935,566
Int. Cl.² C01B *17/60*
U.S. Cl. 423—244 **20 Claims**



1. A process for the removal of contaminant particulates entrained in a fluid stream containing the same, which process comprises:

(a) removing said particulates by passing said fluid stream through at least one controllably moving particulate capture bed comprising magnetizable particles within a scrubber vessel, said bed being expanded and levitated by said stream and controllably moving said bed in response to a pressure differential in said bed, wherein at least a portion of said bed is subjected to an applied magnetic field having a substantial component along the direction of said external force field at a strength such that gross solids backmixing and fluid by-passing in said bed are suppressed but less than that which impairs the fluid-like properties of the bed; and (b) removing the retained particulates from said bed, wherein the product of the magnetic moment of the particulates in said fluid and the magnetic moment of the magnetizable particles is less than about $50(emu/gr)^2$.

4,296,081

PROCESS FOR PURIFYING GASEOUS EFFLUENTS

Michel Nomine, and Gerard Chelu, both of Verneuil-en-Halatte, France, assignors to Charbonnages de France, France

Filed Feb. 1, 1980, Ser. No. 117,674
Claims priority, application France, Feb. 8, 1979, 79 03249
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—245 **10 Claims**

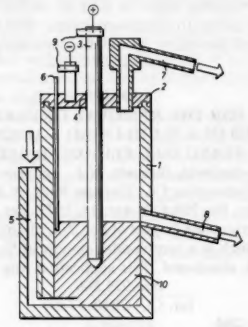
1. A process for purifying aldehyde-containing air comprising submitting the air to the simultaneous action of small quantities of sulphurous anhydride (SO_2) and ammonia, followed by washing with water.

4,296,082

PURIFICATION OF WET PROCESS PHOSPHORIC ACID

Edward J. Lowe, Stourbridge; Michael W. Minshall, Wombourne, and Arthur Wilson, Stourbridge, all of England, assignors to Albright & Wilson Limited, Warley, England

Continuation-in-part of Ser. No. 899,896, Apr. 26, 1978, Pat. No. 4,215,098. This application Apr. 10, 1979, Ser. No. 28,680
The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.
Int. Cl.[3] C01B *25/40, 25/16;* B01D *1/00*
U.S. Cl. 423—305 39 Claims



1. A method for the production of purified phosphoric acid or phosphatic derivatives of wet process phosphoric acid which comprises heating wet process phosphoric acid in an evaporator vessel having carbon walls which are electrically conducting and which are stable to the concentrated phosphoric acid at the evaporation temperatures, to evaporate water therefrom to leave a concentrated acid by direct electrical resistance heating by passing an alternating current through said wet process acid until the concentration of said acid is at least 76% by weight P_2O_5, precipitating solid impurities in said concentrated acid and separating solid impurities from the purified phosphoric acid or phosphatic derivative.

4,296,083

ZEOLITE SYNTHESIS

Louis D. Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 925,015, Jul. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 789,901, Apr. 22, 1977, abandoned. This application Nov. 14, 1979, Ser. No. 93,958
Int. Cl.[3] C01B *33/28*
U.S. Cl. 423—329 14 Claims

1. A method for synthesizing zeolites, said zeolites characterized by an alumina to silica mole ratio of not greater than 0.083 and a constraint index within the approximate range of 1 to 12, which comprises forming a reaction mixture containing one or more sources of alkali metal oxide, organic nitrogen-containing cations provided by an amine, hydrogen ions, an oxide of silicon, water and, optionally, an oxide of aluminum, in which the composition, in terms of mole ratios of oxides, is as follows:

Al_2O_3/SiO_2=0–0.083
OH^-/SiO_2=0
H_2O/SiO_2=5–200
M/SiO_2=0.01–5.0
R/SiO_2=0.01–3.0
H^+(additional)/SiO_2=0–1.0

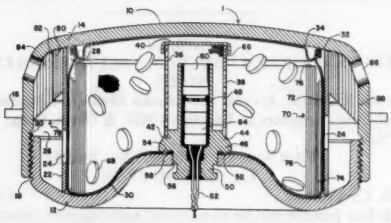
wherein R is an organic nitrogen-containing cation source, M is an alkali metal ion, and wherein the pH of said reaction mixture is at least about 7 and maintaining the reaction mixture at a temperature and pressure for a time necessary to crystallize therefrom said zeolite.

4,296,084

METHOD OF AND APPARATUS FOR GAS GENERATION

Gary V. Adams, Brigham City, and Fred E. Schneiter, Ogden, both of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Oct. 29, 1979, Ser. No. 88,992
Int. Cl.[3] C01B *21/02*
U.S. Cl. 423—351 26 Claims



1. A method of generating clean nitrogen gas in which most of the combustion residue product has been removed comprising

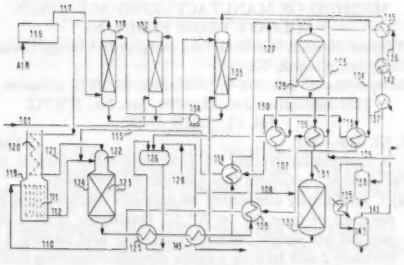
a. providing a combustible composition essentially 60–80% sodium azide, 2–26% ferric oxide, 2–26% molybdenum disulfide and 0–6% sulfur,
b. placing said combustible composition in a combustion chamber having gas discharge orifices,
c. raising the temperature of said combustible composition sufficiently to ignite it, and
d. providing filtering means and cooling means between said combustible composition and said gas discharge orifices, said filtering means being selected for its compatibility with the combustion process and for its characteristic property at the combustion temperature of said composition of becoming less porous for a short interval during an early stage of the combustion function time thereby, during such interval, to increase the restrictive effect thereof and to retard the flow of combustion products out of said gas discharge orifices to allow such combustion products to be cooled by and condensed on said cooling means.

4,296,085

PROCESS FOR THE PRODUCTION OF AMMONIA AND THE CORRESPONDING SYNTHESIS GAS

David L. Banquy, 39 Rue St-Placide, Paris, France (75006)

Filed Mar. 19, 1980, Ser. No. 131,837
Claims priority, application France, Jan. 7, 1980, 80 00196
Int. Cl.[3] C01B *2/02, 2/30;* C01C *1/04*
U.S. Cl. 423—359 9 Claims



6. A process for producing ammonia synthesis gas from a desulfurized hydrocarbon containing feedstock available at a pressure of at least 30 bars, comprising:

(a) dividing said feedstock into two fractions, the first fraction representing 5 to 70 percent of the total feedstock,

(b) subjecting only the first fraction from (a) to a primary steam reforming reaction, by mixing said fraction with steam, and heating the mixture thereof by indirect heat exchange, in the presence of a reforming catalyst, to form a gaseous effluent including hydrogen at a temperature between 680° and 820° C.,

(c) combining the gaseous effluent from (b) with the second fraction from (a), to obtain a gas mixture at a minimum temperature of 550° C. and containing at least 5 mole percent hydrogen and at least 25 percent methane equivalent, on a dry gas basis,

(d) reacting in a single step the gas mixture from (c) with compressed air in a secondary reforming reactor operating under essentially adiabatic conditions and comprising a gas mixing zone and a reaction zone, the amount of air injected into said mixing zone being sufficient to initiate therein the partial oxidation reaction, and said reaction zone containing a single bed of catalyst or catalysts, thus producing a raw synthesis gas at a temperature between 850° and 1100° C. containing an amount of nitrogen appreciably larger than that required to convert to ammonia all the potential hydrogen contained therein, and a molal methane percentage of less than one-tenth of the percent methane equivalent contained in the gas mixture from (c),

(e) shift converting to carbon dioxide carbon monoxide contained in the gas effluent from (d), by reacting said gas effluent with steam in the presence of at least one shift conversion catalyst,

(f) removing essentially all the carbon dioxide contained in the gas effluent from (e), by scrubbing with a solvent,

(g) methanating the residual carbon oxides contained in the gas effluent from (f), by reaction with part of the hydrogen therein, in the presence of a methanation catalyst, thus producing a synthesis gas having a molal H_2/N_2 ratio less than 2.4,

(h) removing the excess nitrogen contained in the gas effluent from (g) by partial condensation and subsequent distillation of said gas effluent at a temperature between −175° and −190° C., thereby producing a final synthesis gas having essentially the stoichiometric composition for ammonia synthesis, and a liquid containing said excess nitrogen, all the refrigeration requirements of said removal being supplied by the expansion of at least part of said liquid to a pressure below 6 bars absolute.

4,296,086

MONITORING PROCESS AND APPARATUS

Paul Whitehead, Binfield Heath, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Dec. 10, 1979, Ser. No. 101,857

Claims priority, application United Kingdom, Dec. 15, 1978, 48663/78

Int. Cl.³ G01N *21/78;* **C01B** *21/06*

U.S. Cl. 423—392 **16 Claims**

1. A process of monitoring the ammonia oxidation conversion efficiency in a nitric acid plant which comprises taking samples of the reactant mixture and of the reaction product, and measuring both the ammonia content in the sample of reactant mixture and the nitrogen oxide content in the sample of reaction product by ultraviolet spectrophotometry using ultraviolet light of wavelength 200–220 nm, the nitrogen oxide content in the sample of reaction product being measured after converting any nitric oxide in said sample to nitrogen dioxide at elevated temperature and pressure.

4,296,087

METHOD FOR PRODUCING CARBON BLACK

Robert J. Lewis, Eden Prairie, Minn., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 946,654, Oct. 2, 1978, Pat. No. 4,237,092. This application May 15, 1980, Ser. No. 150,124

Int. Cl.³ C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—449 **13 Claims**

1. In a method for producing carbon black comprising the steps of:

contacting hot combustion gases and a carbonaceous feed in a reaction zone to thereby produce carbon black and gas;

separating said carbon black from said gas; and

utilizing at least a part of the thus separated gas as a recycle gas to supply at least a part of said hot combustion gases;

the improvement comprising the step of:

maintaining the ratio of the volume of said hot combustion gases to the volume of said carbonaceous feed substantially constant at a desired temperature for said hot combustion gases.

4,296,088

HEAT EXCHANGE TECHNIQUES FOR THE CATALYTIC OXIDATION OF GASEOUS SULFUR COMPOUNDS TO SULFUR TRIOXIDE

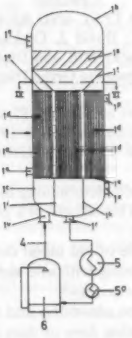
Adolf Staüffer, Pulheim, Fed. Rep. of Germany, assignor to International Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 888,597, Mar. 20, 1978, abandoned. This application Nov. 20, 1979, Ser. No. 96,127

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711897

Int. Cl.³ C01B *17/76, 17/80*

U.S. Cl. 423—533 **13 Claims**



1. In a process for the catalytic oxidation of gaseous sulfur compounds to sulfur trioxide comprising passing said gaseous sulfur compounds through a plurality of serially connected spatially separate zones, each zone being either a catalytic reaction zone which, optionally is in contact with a heat exchange medium or, an uncatalyzed heat exchange zone, and there being at least one catalytic zone in indirect contact with the heat exchange medium and one said heat exchange zone, the improvement which comprises using a liquid heat exchange medium and for each of said catalytic reaction zones which is in contact with said heat exchange medium and for said spatially separate heat exchange zones, the heat exchange is accomplished by circulating said liquid heat exchange medium in indirect heat exchange relationship therewith and with a heat consumer or heat source; the circulation rate being high enough and the amount of the medium being such that the liquid heat exchange medium exchanges heat in said heat exchange zones, said heat exchanged catalytic reaction zones and said heat consumer or source and has a temperature differential of no more than 5 centigrade degrees throughout the circula-

tion path of said heat exchange medium, thereby controlling the temperature of said heat exchange zones; said liquid heat exchange medium remaining liquid throughout the circulation thereof.

4,296,089

INORGANIC FIBERS

Alois Aignesberger, Trostberg, Fed. Rep. of Germany; Walter Lukas, Innsbruck, Austria, and Ekkehard Weinberg, Trostberg, Fed. Rep. of Germany, assignors to Suddeutsche Kalkstickstoff-Werke, Trostberg, Fed. Rep. of Germany

Division of Ser. No. 792,081, Apr. 28, 1977. This application Feb. 28, 1979, Ser. No. 16,054

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621611

Int. Cl.[3] **C01F** *11/46;* **C04B** *11/00*

U.S. Cl. 423—555 **8 Claims**

1. Method for the preparation of calcium sulfate dihydrate fibers or their dehydration products having a ratio of average length to diameter of more than 100:1 and a length of at least 0.2 mm, which method comprises

reacting a dilute aqueous solution of at least one calcium salt at elevated temperature with a dilute aqueous solution of the stoichiometric amount of a water-soluble sulfate at pH values between 8 and 13,

the reaction mixture obtained to stand until the desired fiber length is achieved, and

separating the fibers formed from the solution after achieving the desired length.

4,296,090

ANTI-D TEST AND REAGENT

Henry A. Graham, Jr.; David J. Olekna, both of Annandale; Johnna B. Hawk, Rocky Hill, and Diane M. Barrett, Somerville, all of N.J., assignors to Ortho Diagnostics, Inc., Raritan, N.J.

Continuation-in-part of Ser. No. 57,481, Jul. 13, 1979, abandoned. This application Oct. 5, 1979, Ser. No. 82,199

Int. Cl.[3] **G01N** *33/80*

U.S. Cl. 424—11 **14 Claims**

1. A method for rapidly determining the presence or absence of D antigen on the red blood cells of a given individual which comprises the steps of:

(a) obtaining a sample of red blood cells to be tested;

(b) adding to and mixing with said sample an antibody reagent to form a mixture; and

(c) without incubation observing said mixture to determine whether agglutination does or does not occur;

wherein said antibody reagent comprises reduced and S-alkylated anti-D IgG which has an average titer of at least 32 for Dce cells in the slide test or rapid tube test.

7. A method for preparing an antibody reagent useful for rapidly determining the presence or absence of D antigen on red blood cells, which antibody reagent has an average titer of at least 32 for Dce cells in the slide test or the rapid tube test, which comprises the steps of:

(a) obtaining a substantially lipid-free anti-D human antiserum;

(b) adjusting the pH of said antiserum to about 8.6 by addition of an effective buffering amount of a compatible buffer;

(c) reducing said buffered antiserum with a reducing agent;

(d) S-alkylating said reduced buffered antiserum with an S-alkylating agent;

(e) dialyzing said S-alkylated reduced antiserum at a pH between 7.5 and 8.3; and

(f) adjusting the total protein concentration to about 6–10% by weight by addition of a nonspecific protein.

4,296,091

NOVEL SYNERGISTIC INSECTICIDES

Robert Joly, Montmorency; Charles Pavan, Nogent-sur-Marn, and Pierre R. Carle, Rognonas, all of France, assignors to Roussel Uclaf, Paris, France

Filed Mar. 10, 1980, Ser. No. 128,461

Claims priority, application France, Mar. 16, 1979, 79 06712

Int. Cl.[3] **A01N** *25/00, 37/00, 37/08, 25/06*

U.S. Cl. 424—18 **17 Claims**

1. An insecticidal composition comprising as the active ingredient an insecticidally effective amount of a synergistic mixture of 80 to 70% by weight of (S) 1-oxo-2-allyl-3-methyl-cyclopent-2-en-4-yl d trans chrysanthemate and 20 to 30% by weight of (R) 1-oxo-2-allyl-3-methyl-cyclopent-2-en-4-yl d trans chrysanthemate.

4,296,092

MUCOLYTIC BENZENE AND THIOPHENE-CARBOTHIOIC ACID 2-AMINOALKYL ESTER ACID SALTS

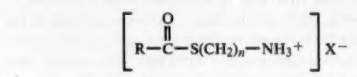
Harry R. Munson, Jr., Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 932,747, Aug. 10, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,761

Int. Cl.[3] **A61K** *9/00, 31/38, 31/265*

U.S. Cl. 424—43 **18 Claims**

1. A method of combatting mucus build-up in an animal body for the purpose of alleviating lung congestion in an animal suffering therefrom which comprises administering to said animal an effective amount of a compound having the formula:



wherein;

R is 2-thiophene, benzene and benzene substituted by one to 3 radicals which may be the same or different, selected from halogen, lower-alkyl, lower-alkoxy, carboxy, trifluoromethyl;

X^- is a chlorine or bromine radical, and

n is 2 or 3.

18. 2-thiophenecarbothioic acid, 2-aminoethyl ester monohydrochloride.

4,296,093

CYCLIC CARBOXAMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT

David G. Rowsell, Staines; John M. Gascoyne, Southall, and Roger Hems, Maidenhead, all of England, assignors to Wilkinson Sword Limited, London, England

Division of Ser. No. 351,356, Apr. 16, 1973, abandoned. This application Feb. 4, 1980, Ser. No. 118,205

Int. Cl.[3] **A61K** *9/68, 31/16*

U.S. Cl. 424—45 **12 Claims**

1. In a manufactured consumer product for application to or consumption by the human body and being:

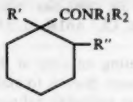
(a) a personal care product comprising a topically or orally administrable base medium containing a flavourant, colourant, perfume, surface active agent or antiseptic agent;

(b) an ingestible preparation comprising an edible or potable base containing a flavourant or colourant.

(c) a pharmaceutical preparation comprising a topically or orally administrable pharmaceutically acceptable carrier and an active pharmaceutical ingredient; or

(d) a tobacco containing consumer product, said consumer product also containing an ingredient capable of stimulating the cold receptors of the nervous system of the surface tissues of the body when brought into contact therewith by application or consumption of the said product, the

improvement which comprises using as said cold receptor stimulating ingredient an effective amount of a cyclic carboxamide of the formula



wherein

R′ is C_1–C_5 alkyl and R″ is hydrogen or C_1–C_5 alkyl, with the proviso that R′ and R″ together provide a total of from 1–8 carbon atoms; and

R_1 and R_2 are each hydrogen, C_1–C_5 alkyl or C_1–C_8 hydroxyalkyl and together provide a total of 0 to 8 carbon atoms, with the proviso that when R_1 is H then R_2 may also be alkylcarboxyalkyl of up to 6 carbon atoms.

4,296,094

DENTAL CLEANING COMPOSITION AND METHOD

Yoshio Matsushima; Teruhiko Kumura; Isamu Kawamura, all of Takamatsu, and Terushige Kawata, Tokushima, all of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,165
Int. Cl.³ A61K 7/16, 7/18
U.S. Cl. 424—49 12 Claims

1. A dental cleaning composition comprising about 0.01 to about 30% by weight, based on the composition, of a hydrotalcite compound of the following formula

$$Mg_{1-x}Al_x(OH)_{2+x-ny}A_y^{n-}.mH_2O$$

wherein

A^{n-} represents an anion having a valence of n,

x is a positive number represented by $O<x<0.5$,

y is a positive number represented by $O<y\leqq 0.5$, and

m is a positive number represented by $O<m<2$, and at least one dentally acceptable carrier or diluent selected from the group consisting of polishing agents, moisture-retaining agents, binders, and foaming agents.

4,296,095

DENTAL AND MOUTH CARE PREPARATIONS

Udo Hoppe, Hamburg; Gerhard Sauermann, Wiemersdorf; Julius Curts, Hamburg, all of Fed. Rep. of Germany; Per-Olof Glantz, Lund, Sweden; Bo Krasse, Askim, Sweden; Kare Larsson, Hovas, Sweden; Börje Noren, Upsala, Sweden; Göran Odham, Södra Sandby, Sweden, and Jan Olsson, Hovas, Sweden, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 944,195
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742411
Int. Cl.³ C07C 101/24; A61K 7/22
U.S. Cl. 424—52 10 Claims

1. A method for preventing the formation of dental plaque and tartar on teeth comprising applying to said teeth an effective amount of a composition comprising from 0.1 to 20% by weight, based on the total weight of the composition, of a compound of the formula

$$H_2N.CH_2(CH_2)_3.CH(NH_2).COOR.X_n$$

wherein R is selected from the group consisting of straight chain alkyl, branched chain alkyl and alkenyl all having 14 to 18 carbon atoms, X is a group which renders said compound a salt and n has a value of 0, 1 or 2, and a carrier suitable for application to said teeth, and the inside of the mouth.

4,296,096

HIGH VISCOSITY DENTIFRICE

Robert C. Pierce, Plainsboro, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 54,779, Jul. 5, 1979, abandoned. This application Mar. 25, 1980, Ser. No. 133,706
Int. Cl.³ A61K 7/16, 7/18
U.S. Cl. 424—52 9 Claims

1. A dentifrice toothpaste or gel having a viscosity of about 50,000 to 420,000 cps (measured at 10 rpm with #7 spindle on Brookfield Viscometer Model RBF at 22° C.), said viscosity being sufficiently high so that said dentifrice is not liquid and runny and not so high that it is difficult to extrude from a dentifrice containing a normally water-insoluble dentally acceptable polishing agent, up to about 89.5% by weight of water and requiring added humectant and gelling agents, said dentifrice containing, as its sole essential humectant and gelling agent, a water-absorbent anionic polyelectrolyte polymer which provides and imparts both gelling and humectant characteristics to said dentifrice, said anionic polyelectrolyte polymer consisting essentially of a polyacrylic acid ionically complexed with a polyvalent metal cation selected from the group consisting of aluminum, zirconium, iron and zinc at a pH between 2.0 and 8.5 which pH is below the pH of reversibility of the ionic complex of said polyvalent cation and said water absorbent anionic polyelectrolyte, said ionically complexed polyelectrolyte polymer having a particle size such that at least about 90% of the particles are larger than 2 microns, each of said particles having a linkage density at the particle surface greater than the linkage density in the particle interior, the linkages at the particle surface comprising at least in part ionic complexing of said anionic polyelectrolyte polymer by said polyvalent metal cations, said anionic polyelectrolyte polymer being provided in said dentifrice in an amount of about 0.5–20% by weight, said dentifrice containing a humectant and gelling agent selected from the group consisting of: (a) said anionic polyelectrolyte polymer as the sole humectant and gelling agent; (b) said anionic polyelectrolyte polymer as the sole gelling agent and up to about 20% by weight of an additional humectant; (c) said anionic polyelectrolyte polymer as the sole humectant and up to about half the amount of said anionic polyelectrolyte polymer of an additional gelling agent; and (d) said anionic polyelectrolyte polymer with up to about 20% by weight of an additional humectant and up to about half the amount of said anionic polyelectrolyte polymer of an additional gelling agent; wherein said additional humectant and said additional gelling agent provide rheological modifications in the character of said dentifrice.

4,296,097

SUPPRESSION OF REAGINIC ANTIBODIES TO DRUGS EMPLOYING POLYVINYL ALCOHOL AS CARRIER THEREFOR

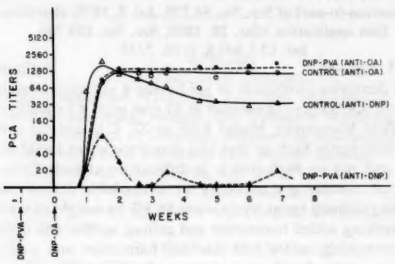
Weng Y. Lee, 99 Silver Ridge Rise NW., Calgary, Alberta, Canada (T3B 4P6), and Alec Sehon, 695 Academy Rd., Winnipeg, Manitoba, Canada (R3N 0E8)

Filed Feb. 27, 1979, Ser. No. 15,864
Int. Cl.³ A61K 31/74, 31/43
U.S. Cl. 424—78 9 Claims

1. A process for the suppression of the formation of anti-BPO (benzylpenicilloyl) antibodies in a person sensitive to penicillin which comprises administering to said person a suppressing effective amount of a conjugate that is prepared by the reaction of penicillin with an amino derivative of water-soluble, nonimmunogenic polyvinylalcohol polymers, said reaction being carried out in the presence of a suitable salt and at an alkaline pH.

9. A process for the suppression of IgE antibodies which are responsible for allergies to a wide spectrum of drugs which comprises administering a suppressing effective amount of a

conjugate that is prepared by the reaction of the potentially allergenic drug with an amino derivative of water-soluble,



nonimmunogenic polyvinylalcohol polymers in the presence of a suitable salt and at an alkaline pH.

4,296,098

COMPOSITIONS AND METHODS FOR THE TREATMENT OF ATHLETE'S FOOT

Masataro Sato, 2-chome, No. 28-26 Fukuokamachi, Takamasatu City, Japan

Continuation of Ser. No. 882,790, Mar. 2, 1978, abandoned, which is a division of Ser. No. 759,492, Jan. 14, 1977, Pat. No. 4,108,984. This application May 31, 1979, Ser. No. 44,305
The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.
Int. Cl.[2] **A61K** *37/48*
U.S. Cl. 424—94 **1 Claim**

1. A composition for the treatment of wet athlete's foot, comprising a dry mixture of finely powdered montmorillonite and pyroligneous acid in a weight ratio of about 4:1, and a small quantity of papain enzyme present in an amount of about 1/5000 by weight of the mixture.

4,296,099

PROCESS FOR EXTRACTING EMBRYONIC CALF SKIN AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Claudine Berrebi, and Georges Manoussos, both of Paris, France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 746,018, Nov. 30, 1976, abandoned. This application May 13, 1980, Ser. No. 149,561
Int. Cl.[2] **A61K** *35/48, 7/42*
U.S. Cl. 424—105 **10 Claims**

1. A process for preparing an embryonic calf skin extract having improved cicatrisive activity from calf skin taken between the second month of gestation and birth comprising the steps of (i) grinding said embryonic calf skin, (ii) extracting the resulting ground embryonic calf skin in an aqueous medium at a pH of 4 obtained by the addition thereto of an organic acid selected from the group consisting of acetic acid, citric acid, trichloroacetic acid, succinic acid, ascorbic acid and lactic acid, the ratio of calf skin, kg/liter of said aqueous extraction medium being between 1:1 to 1:4 and at a temperature between 60° C. and 75° C. for 15 hours, (iii) separating the resulting extract from the insolubles, and (iv) lyophilizing the said separated extract.

2. An extract of embryonic calf skin having improved cicatrisive activity obtained in accordance with the process of claim 1.

4,296,100

METHOD OF TREATING THE HEART FOR MYOCARDIAL INFARCTION

Wayne P. Franco, 79 Two Stone Dr., Wethersfield, Conn. 06109

Filed Jun. 30, 1980, Ser. No. 164,074
Int. Cl.[3] **A61K** *35/55*
U.S. Cl. 424—108 **13 Claims**

1. A method of treating an area in the heart of a patient subjected to ischemic heart disease, to maintain viability in that area for a sustained time period to salvage said area,

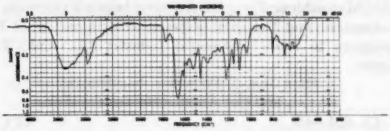
said method comprising applying an effective dose of FGF to the heart.

4,296,101

ANTIBIOTIC KRISTENIN

Frank L. Weisenborn, Titusville; William E. Brown, Princeton, and Edward Meyers, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 13, 1978, Ser. No. 877,199
Int. Cl.[3] **A61K** *35/00;* **C12P** *13/00, 1/04;* **C12R** *1/125*
U.S. Cl. 424—119 **4 Claims**



1. The antibiotic kristenin having the infrared spectrum in KBr 3350, 2950, 1660, 1620, 1525, 1455, 1225, 1160, 1110, 805 and 690 cm^{-1} shown in the FIGURE, the ultraviolet spectrum in methanol λmax 210 nm (27100), 247 nm (6090), 314 nm (4200), $[\alpha]_D^{methanol}$ −81.9°, and the approximate elemental analysis C, 56.58, H, 6.90, and N, 9.92.

4,296,102

METHOD OF COMBATING AMEBIASIS IN HUMANS

Felipe Laso, Montecito 59, Mexico City, Mexico

Filed Jun. 12, 1980, Ser. No. 158,649
Int. Cl.[3] **A61K** *33/40, 33/22, 33/20*
U.S. Cl. 424—130 **4 Claims**

1. The method of combating amebiasis in a human suffering from amebiasis, comprising orally administering to said human, an amount effective to combat said amebiasis, of a perborate stabilized aqueous solution of chlorine oxides formed by adding to 1000 cc of water the following:

80–120 grams sodium chlorite

90–130 grams sodium hypochlorite (13% aqueous solution)

5–7.5 cc of 37.7% hydrochloric acid

2–4.5 cc of 98.15% sulfuric acid

4–12 grams of an inorganic perborate selected from the group consisting of sodium perborate and potassium perborate, and

8–15 grams of sodium peroxide or an equivalent amount of potassium peroxide, hydrogen peroxide, potassium percarbonate, or sodium percarbonate.

4,296,103

STABILIZED SOLUTION OF CHLORINE OXIDES

Felipe Laso, Montecito 59, Mexico City DF, Mexico

Filed Aug. 8, 1980, Ser. No. 176,278
Int. Cl.[3] **A61K** *33/40, 33/22, 33/20, 33/02*
U.S. Cl. 424—130 **7 Claims**

1. A stabilized orally administrable aqueous therapeutic solution of chlorine oxides containing boron prepared by the addition to 1000 parts by weight of water the following:

80–120 parts by weight of sodium chlorite;

90–130 parts by weight of a 13% aqueous solution of sodium hypochlorite;

5–10 cc of 37.7% hydrochloric acid;
2–4.5 cc of 98.15% sulfuric acid;
4–15 parts by weight of an inorganic perborate selected from sodium perborate or potassium perborate; and
8–15 parts by weight of sodium peroxide.

4,296,104

THERAPEUTIC DIMETHYL SULFOXIDE COMPOSITION AND METHODS OF USE

Robert J. Herschler, 3080 NW. 8th St., Camas, Wash. 98607

Filed Aug. 30, 1979, Ser. No. 71,072
Int. Cl.³ A61K *31/10, 31/17, 33/14*
U.S. Cl. 424—153 **8 Claims**

1. In a method for administrating dimethyl sulfoxide to a host, the improvement comprising reducing the side effects of malodorous breath and skin reactions normally associated with such dimethyl sulfoxide administration, comprising the step of:
administrating to said host a composition comprising dimethyl sulfoxide and a side-effect reducing agent taken from the group consisting of urea, or ethanol or mixtures thereof in an amount which is effective for said purpose.

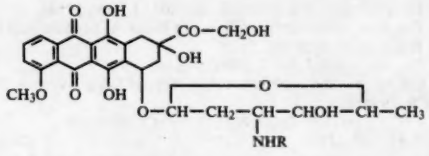
4,296,105

DERIVATIVES OF DOXORUBICINE, THEIR PREPARATION AND USE

Roger M. Baurain, Kraainem, and Andre B. L. Trouet, Winksele, both of Belgium, assignors to Institut International de Pathologie Cellulaire et Moleculaire, Brussels, Belgium

Filed Jul. 5, 1979, Ser. No. 55,291
Claims priority, application Belgium, Aug. 3, 1978, 869485
Int. Cl.³ A61K *31/71;* C07H *15/24*
U.S. Cl. 424—180 **7 Claims**

1. Derivatives of doxorubicine selected from the group consisting of a compound of the formula



wherein R is D—, L— and DL-leucyl and the acid addition salts thereof.

5. A veterinary composition, which contains an antitumoral effective amount of N-leucyl-doxorubicine or an acid addition salt thereof together with one or more compatible and pharmaceutically acceptable diluents or additives.

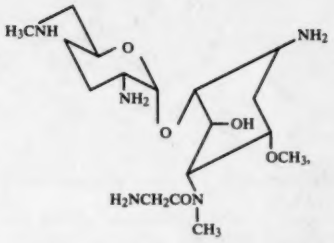
4,296,106

ISTAMYCINS AND PRODUCTION THEREOF

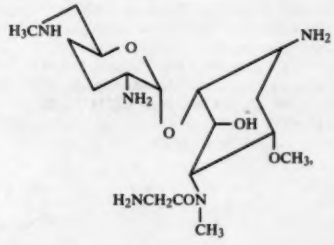
Hamao Umezawa; Yoshiro Okami, both of Tokyo, and Shinichi Kondo, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,492
Claims priority, application Japan, May 1, 1979, 54/52517; Sep. 17, 1979, 54/117912
Int. Cl.³ A61K *31/71;* C07H *15/22*
U.S. Cl. 424—181 **7 Claims**

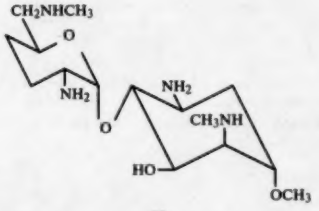
1. The new compound, istamycin, which is selected from istamycin A of the formula



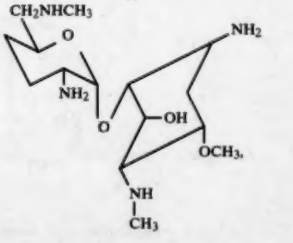
istamycin B of the formula



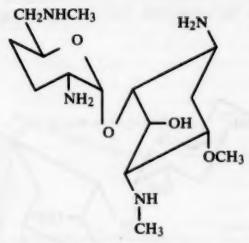
istamycin A_o of the formula



or



and istamycin B_o of the formula



and mixtures thereof, or a nontoxic pharmaceutically acceptable acid-addition salt thereof.

7. A method for inhibiting bacterial growth in an animal susceptible to said bacterial growth which comprises administering to said animal an antibacterially effective amount of at least one of istamycin A, istamycin B and nontoxic pharmaceutically acceptable acid-addition salts thereof.

4,296,107

MILDIOMYCIN ANALOGS AND A METHOD OF PRODUCTION

Takashi Suzuki, Takatsuki; Hidekazu Sawada, Neyagawa, and Kazuyoshi Katamoto, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

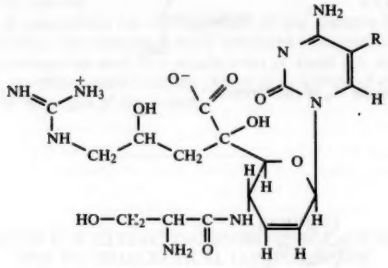
Filed Aug. 19, 1980, Ser. No. 179,555

Claims priority, application Japan, Aug. 24, 1979, 54-108330

Int. Cl.[3] **A61K** *31/70;* **C07H** *17/00*

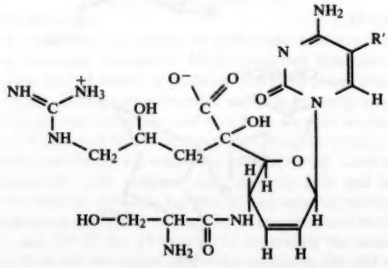
U.S. Cl. 424—180 **10 Claims**

1. A compound of the formula:

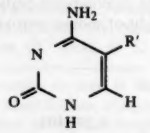


wherein R is hydrogen, a halogen atom or a lower alkyl group, or an acid salt thereof.

8. A process for producing a compound of the formula:

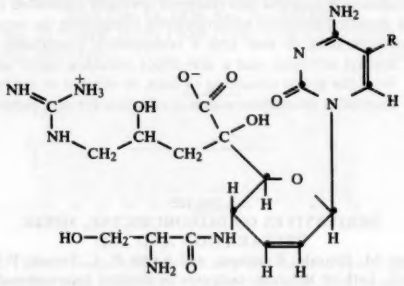


wherein R' is hydrogen, a halogen atom, a lower alkyl group or a hydroxymethyl group, or an acid salt thereof, which comprises cultivating a mildiomycin-microorganism belonging to the genus Streptoverticillium in a culture medium containing a compound of the formula:



wherein R' has the same meaning as above, or an acid salt thereof to have said compound elaborated and accumulated in the culture broth.

10. A plant fungicidal and acaricidal composition which comprises a fungicidally or acaricidally effective amount of a compound of the formula



wherein R is hydrogen, a halogen atom or a lower alkyl group, or an acid salt thereof and a carrier therefor.

4,296,108

2,2-DICHLOROCYCLOPROPYL-METHYL-PHOSPHORIC ACID DERIVATIVES

Rainer Bürstinghaus, Weinheim-Lützelsachsen; Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

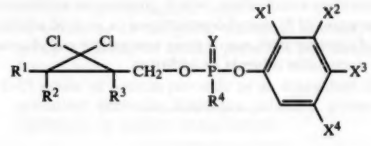
Filed Jul. 7, 1980, Ser. No. 166,573

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934229

Int. Cl.[3] **C07F** *9/09, 9/165;* **C01N** *57/04*

U.S. Cl. 424—210 **6 Claims**

1. 2,2-Dichlorocyclopropyl-methyl-phosphoric acid derivatives of the formula



(I),

where

R^1, R^2 and R^3 are identical or different and are hydrogen or methyl,

R^4 is unbranched or branched alkoxy of up to 4 carbon atoms, unbranched or branched alkylthio of up to 4 carbon atoms, amino, or alkylamino or dialkylamino, wherein each alkyl is of up to 5 carbon atoms and is linear or branched,

Y is oxygen or sulfur and

X_1, X_2, X_3 and X_4 are identical or different and each is hydrogen, halogen, nitro, cyano, methyl or methylthio.

6. A process for combating pests, wherein an effective

amount of a 2,2-dichlorocyclopropyl-methyl-phosphoric acid derivative of the formula I as claimed in claim 1 is allowed to act on the pests or their habitat.

4,296,109

CORTICOID 21-SULFOPROPIONATES AND THE SALTS THEREOF, A PROCESS FOR THE PRODUCTION THEREOF AND PHARMACEUTICAL PREPARATIONS THEREOF

Henry Laurent; Peter Esperling; Joachim-Friedrich Kapp, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

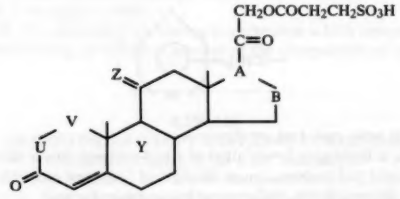
Filed Oct. 9, 1979, Ser. No. 81,947

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843690; Aug. 6, 1979, 2032166

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—241 **28 Claims**

1. A corticoid 21-sulfopropionate of the formula



X

wherein

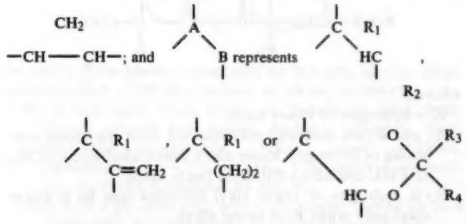
represents a single of double bond;

X is hydrogen, chlorine, fluorine or methyl;

Y is hydrogen, fluorine or chlorine;

Z is oxo, or hydrogen in the α-position and hydroxy in the β-position;

—U—V represents —CH_2—CH_2—, —CH=CH— or



wherein R_1 is hydrogen, hydroxy or acyloxy, wherein the acyl group is derived from a C_{1-8} hydrocarbon carboxylic acid; R_2 is hydrogen or methyl; and R_3 and R_4 are independently each alkyl of 1–4 carbon atoms; and the salts thereof with physiologically acceptable bases.

28. A method of treating shock which comprises administering to a patient suffering from shock an amount of a compound of claim **1** effective for treatment of shock.

4,296,110

ANTIHYPERTENSIVE I-SUBSTITUTED CYCLIC LACTAM-2-CARBOXYLIC ACIDS

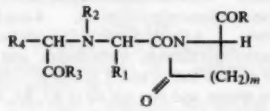
Alexander L. Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1980, Ser. No. 201,471

Int. Cl.³ A61K ; C07D ; A61K

U.S. Cl. 424—244 **11 Claims**

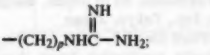
1. A compound of the formula:



where

R and R_3 are independently OH, C_1–C_4 alkoxy or benzyloxy;

R_1 is H, CH_3, C_2H_5, CF_3, isobutyl, isoamyl, $—(CH_2)_nNHR_5$ or



R_2 is H or CH_3;

R_4 is C_1–C_{10} alkyl, $—(CH_2)_qC_6H_5$ or $—(CH_2)_rNH_2$;

R_5 is H or C_1–C_4 alkyl;

m is 2, 3 or 4;

n is an integer from 1–6;

p is an integer from 1–6;

q is an integer from 0–6; and

r is an integer from 1–6;

and pharmaceutically acceptable salts thereof.

11. A method of treating hypertension in mammals which comprises administering to the mammal an effective hypertensive amount of a compound of claims **1** to **9**.

4,296,111

7-SUBSTITUTED METHYL CEPHALOSPORINS DERIVATIVES AND ANALOGUES THEREOF

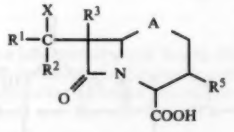
Thomas R. Beattie; Burton G. Christensen, both of Scotch Plains, and Frank P. Dininno, Old Bridge, all of N.J., assignors to Merck & Co. Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 815,475, Jul. 14, 1977, abandoned, which is a continuation of Ser. No. 634,082, Nov. 21, 1975, abandoned. This application Jun. 14, 1979, Ser. No. 48,551

Int. Cl.³ C07D *501/00*

U.S. Cl. 424—246 **3 Claims**

1. A compound having the structural formula:



and the non-toxic, pharmaceutically acceptable salts thereof; wherein:

the dotted line indicates provision for both Δ^2 and Δ^3 embodiments:

A is S and SO;

R^3 is hydrogen, methoxyl, and lower alkylthio;

X is OH, SH, NH_2, =O and =NH;

R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, phenethyl, 2-thienylmethyl, and phenyl;

R^5 is hydrogen, chloro, lower alkoxy, formyl and $—(CH_2)_nY$ wherein n is an integer from 1–6 and Y is

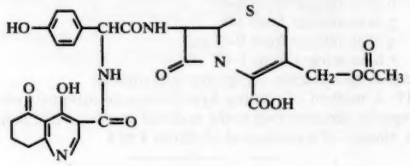
hydrogen, hydroxy, halogen, lower alkanoyloxy, lower alkanoylthio, lower alkoxy, phenoxy, benzyloxy, azido, amino, N-lower alkylamino, N,N-dilower alkylamino, N-lower alkanoylamino, N,N-dilower alkanoylamino, carbamoyl or thiocarbamoyl and the N-lower alkyl or N,N-dilower alkyl derivatives thereof, pyridinium, 3-methylpyridinium, 4-methylpyridinium, 3-chloropyridinium, 3-bromopyridinium, 3-iodopyridinium, 4-carbamoylpyridinium, 4-(N-hydroxymethylcarbamoyl)-pyridinium, 4-(N-carbomethoxycarbamoyl)pyridinium, 4-(N-cyanocarbamoyl)pyridinium, 4-(carboxymethyl)-pyridinium, 4-(hydroxymethyl)pyridinium, 4-(trifluoromethyl)pyridinium, quinolinium, and luthidinium; with the proviso that, when X is =O or =NH, one of R^1 and R^2 is absent, and that not all of R^1, R^2, R^3 and R^5 are hydrogen at the same time.

4,296,112
CEPHALOSPORINS

Akira Matsubara, Yokohama; Hideaki Sakai, Fujisawa; Makoto Odate, Yokohama; Toshio Suganuma, Mobara, and Takuo Nakano, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 17, 1979, Ser. No. 104,292
Claims priority, application Japan, Apr. 19, 1979, 54/47275
Int. Cl.³ C07D *501/20*
U.S. Cl. 424—246 **6 Claims**

1. A cephalosporanic acid of the formula



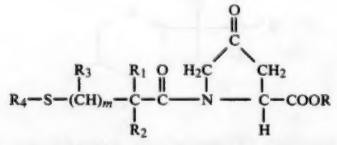
and pharmaceutically acceptable salts and esters thereof.

4,296,113
MERCAPTOACYL DERIVATIVES OF KETO SUBSTITUTED PROLINE AND PIPECOLIC ACID

Miguel A. Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 14, 1980, Ser. No. 112,004
Int. Cl.³ A61K *31/40, 31/44;* **C07D** *207/16, 401/12*
U.S. Cl. 424—246 **20 Claims**

1. A compound of the formula



or a physiologically acceptable salt thereof, wherein

R is hydrogen or lower alkyl;

R_1 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, $—(CH_2)_n—SH$, and halo substituted lower alkyl;

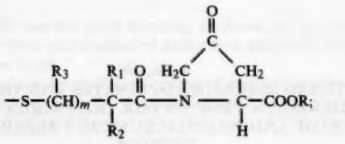
R_2 is hydrogen or lower alkyl provided that R_2 is lower alkyl only when R_1 is lower alkyl;

m is zero, one or two;

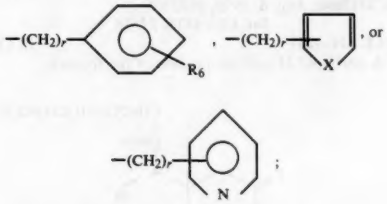
n is one, two, or three;

R_4 is hydrogen,

p-methoxybenzyl, trityl, or provided that neither R_1 nor R_3 is $—(CH_2)_n—SH$



R_5 is lower alkyl, chloro, bromo or fluoro substituted lower alkyl, $—(CH_2)_r—$cycloalkyl wherein the cycloalkyl group is a saturated ring of 3 to 7 carbons,

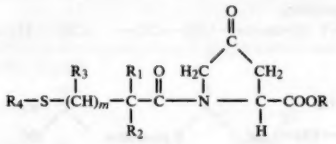


r is zero, one, two, or three;

R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy; and

X is oxygen or sulfur.

16. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and an effective amount of one or more hypotensive agents or physiologically acceptable salts thereof of the formula



wherein

R is hydrogen or lower alkyl;

R_1 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, $—(CH_2)_n—SH$, and halo substituted lower alkyl;

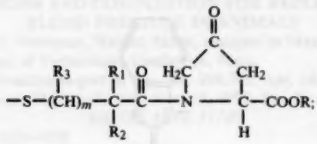
R_2 is hydrogen or lower alkyl provided that R_2 is lower alkyl only when R_1 is lower alkyl;

m is zero, one, or two;

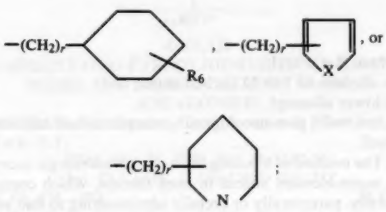
n is one, two, or three;

R_4 is hydrogen,

or provided that neither R_1 nor R_3 is $—(CH_2)_n—SH$



R_5 is lower alkyl, chloro, bromo, or fluoro substituted lower alkyl, $-(CH_2)_r-$cycloalkyl wherein the cycloalkyl group is a saturated ring of 3 to 7 carbons,



r is zero, one, two, or three;

R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy; and

X is oxygen or sulfur.

20. The method of alleviating hypertension which comprises administering an effective amount of the composition of claim **16**.

4,296,114

3,4-DIHYDRO-3-OXOPYRIDO[2,3-B]-PYRAZINES, COMPOSITIONS AND USE THEREOF

Richard A. Appleton, and David Johnston, both of Loughborough, England, assignors to Fisons Limited, London, England

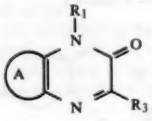
Filed Aug. 2, 1979, Ser. No. 63,357

Claims priority, application United Kingdom, Aug. 15, 1978, 33431/78; Dec. 13, 1978, 48438/78

Int. Cl.[3] **A61K** *31/495, 31/535;* **C07D** *471/08*

U.S. Cl. 424—248.52 **10 Claims**

1. A compound of formula I,



I

in which R_1 is phenyl substituted by halogen, alkoxy, alkyl, carboxy-alkyl, $-NR_4R_5$, carboxy or alkoxy carbonyl,

R_3 is hydrogen, alkyl, mono- or di-carboxy alkyl, halo, alkoxy, phenyl, halo-phenyl, hydroxy, phenoxy, thiol, thioalkoxy, thiophenoxy, $-NR_4R_5$, cyano, —COOH, carboxyureido, $-CF_3$, $-COR_6$, hydroxyalkyl, aminoalkyl, or alkoxy substituted by NR_4R_5,

ring A is a pyridine ring which optionally carries up to 4 substituents R_3, which may be the same or different,

R_4 and R_5, which may be the same or different, each represent hydrogen, phenyl, halophenyl or alkyl, the alkyl optionally being substituted by alkoxy or by a mono- or di-alkyl or unsubstituted amino group; or R_4 and R_5, together with the nitrogen atom to which they are attached, form a piperidine, morpholine or an optionally alkyl substituted piperazine ring, and

R_6 is hydrogen or alkyl,

each of R_3 and any substituent on ring A or on the R_1 phenyl group, when they contain carbon, containing up to and including 10 carbon atoms,

provided that when R_1 is phenyl substituted by methoxy, R_3 is not phenyl,

or a pharmaceutically acceptable salt, ester or amide thereof.

9. A pharmaceutical composition for treatment of an inflammatory condition comprising an effective amount of a compound according to claim **1**, as active ingredient, in admixture with a pharmaceutically acceptable adjuvant, diluent or carrier.

4,296,115

PYRIDYLALKYLAMINES

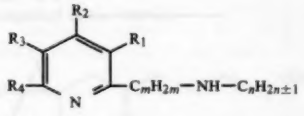
Leslie J. Browne, Morristown, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 1, 1980, Ser. No. 145,533

Int. Cl.[3] **C07D** *213/36;* **A61K** *31/44*

U.S. Cl. 424—263 **8 Claims**

1. A secondary hydroxypyridylalkylamine of the formula



wherein one of R_1, R_2 and R_4 is hydroxy, and the others, as well as R_3, are hydrogen or lower alkyl; m is an integer from 2 to 4; and n is an integer from 1 to 7; or a pharmaceutically acceptable acid addition salt thereof.

4,296,116

FUNGICIDAL AGENTS, PROCESSES FOR THEIR PREPARATION AND THEIR USE FOR COMBATING FUNGI

Helmut Kaspers, Leverkusen, and Wilhelm Brandes, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

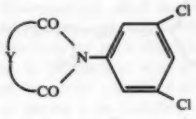
Filed Oct. 26, 1979, Ser. No. 88,688

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849695; Jul. 31, 1979, 2931034

Int. Cl.[3] **A01N** *43/76, 41/06, 43/80, 43/50*

U.S. Cl. 424—272 **9 Claims**

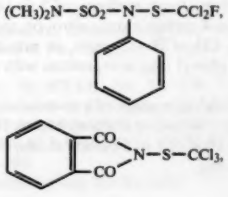
1. A fungicidal composition comprising a fungicidally effective amount of (1) at least one carboximide of the formula



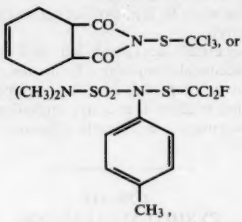
in which

Y represents a bifunctional group linking the two carbonyl groups with formation of an optionally substituted 5-membered heterocyclic ring with a total of 1 or 2 hetero-atoms (O and N),

and (2),



-continued



the weight ratio of component (1) to component (2) ranging from about 1:1 to 1:4.

4,296,117

1-ARYLOXY-2-HYDROXY-3-[(BENZIMIDAZOLINONE-SUBSTITUTED ALKYL)-AMINO]PROPANES AND SALTS THEREOF

Herbert Köppe, Ingelheim am Rhein; Anton Mentrup, Mainz-Kastel; Ernst-Otto Renth; Kurt Schromm, both of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, and Gojko Muacevic, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

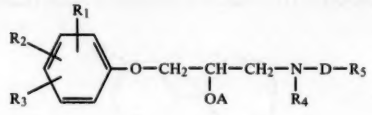
Division of Ser. No. 4,279, Jan. 17, 1979, Pat. No. 4,256,756, which is a continuation-in-part of Ser. No. 838,450, Oct. 3, 1977, abandoned. This application Jan. 16, 1980, Ser. No. 112,640

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644833

Int. Cl.[3] **A61K** *31/415;* **C07D** *235/26*

U.S. Cl. 424—273 B **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen; halogen; trifluoromethyl; nitro; alkyl of 1 to 8 carbon atoms; alkoxy of 1 to 4 carbon atoms; alkoxyalkyl of 2 to 8 carbon atoms; alkenyl of 2 to 5 carbon atoms; alkynyl of 2 to 5 carbon atoms; alkenyloxy of 3 to 6 carbon atoms; alkynyloxy of 3 to 6 carbon atoms; $-(CH_2)_x-A'$, where x is 1, 2 or 3 and A' is cyano, amino, carboxamido or hydroxyl; phenoxy; benzyloxy; or $-CH_2-SO_2-CH_3$;

R_2 is hydrogen; halogen; alkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; aralkoxy of 7 to 14 carbon atoms; alkenyl of 2 to 4 carbon atoms; nitro; or, together with R_3, $-CH=CH-CH=CH-$, which is attached to carbon atoms of the phenyl ring in o-position with respect to each other;

R_3 is hydrogen; halogen; alkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; or aralkoxy of 7 to 14 carbon atoms;

R_4 is hydrogen; alkyl of 1 to 5 carbon atoms; or aralkyl of 7 to 14 carbon atoms;

R_5 is

where B is

where R_{12} is aryl;

D is alkylene of 1 to 12 carbon atoms; and

A is lower alkanoyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3. The method of blocking the α- and β-adrenergic receptors in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective amount of a compound of claim **1**.

4,296,118

FUNGICIDAL 3-[N-(PYRAZOL-1-YL-ACETYL)-N-(SUBSTITUTED PHENYL)]-AMINO-TETRAHYDRO-2-FURANONES

Walter Kunz, Oberwil, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Adolf Hubele, Magden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

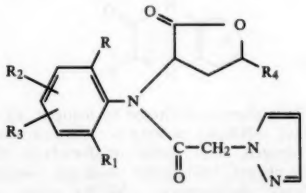
Division of Ser. No. 2,490, Jan. 11, 1979, abandoned, which is a division of Ser. No. 873,585, Jan. 30, 1978, Pat. No. 4,147,792. This application Aug. 22, 1980, Ser. No. 180,266

Claims priority, application Switzerland, Feb. 4, 1977, 1381/77; Mar. 28, 1977, 3884/77

Int. Cl.[3] **A01N** *43/56, 43/08;* **C07D** *405/12*

U.S. Cl. 424—273 P **4 Claims**

1. A compound of the formula I



wherein

R represents C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

R_1 represents C_1–C_3-alkyl, C_1–C_4-alkoxy or halogen,

R_2 represents hydrogen, C_1–C_3-alkyl, C_1–C_4-alkoxy or halogen,

R_3 represents hydrogen or methyl, with the total number of C atoms of the substituents R, R_1, R_2 and R_3 in the phenyl ring not exceeding the number 8, and

R_4 represents hydrogen or methyl,

4. A fungicidal composition containing as active substance a fungicidally effective amount of a compound according to claim **1** or **2**, together with a suitable inert carrier therefor.

4,296,119

PROCESS AND COMPOSITION FOR REDUCING BLOOD PRESSURE IN ANIMALS

Richard J. Wurtman, Waban, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 898,740, Apr. 24, 1978, abandoned. This application Nov. 27, 1978, Ser. No. 963,857
Int. Cl.[3] A61K *31/40*
U.S. Cl. 424—274 2 Claims

1. The process for reducing blood pressure in an animal afflicted with high blood pressure which comprises administering to said animal tryptophan to the animal in an amount effective to reduce blood pressure of at least about 5 mg/kg body weight.

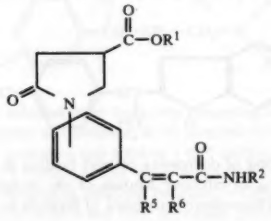
4,296,120

(CARBOXY-OXO-PYRROLIDINO)PHENYLALKENAMIDES AND ESTERS THEREOF AS SRS-A ANTAGONISTS

Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 28, 1980, Ser. No. 182,162
Int. Cl.[3] A61K *31/40;* C07D *207/277*
U.S. Cl. 424—274 21 Claims

1. An alkenamide compound of the formula

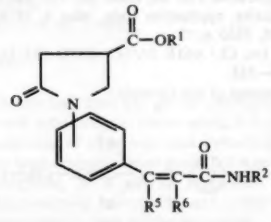


and a pharmaceutically-acceptable salt thereof;

wherein R^1 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons and $—CH_2—CH_2—NR^3R^4$, wherein R^3 and R^4 are each alkyl having 1 to 3 carbons;

R^2 is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons; and R^5 and R^6 are selected from the group consisting of hydrogen and methyl.

11. A method for antagonizing the effect of slow-reacting substance of anaphylaxis in a human subject, which comprises administering to said subject a slow-reacting substance of anaphylaxis antagonizing amount of an alkenamide compound of the formula



or a pharmaceutically-acceptable salt thereof;

wherein R^1 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons and $—CH_2—CH_2—NR^3R^4$, wherein R^3 and R^4 are each alkyl having 1 to 3 carbons;

R^2 is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons; and R^5 and R^6 are selected from the group consisting of hydrogen and methyl.

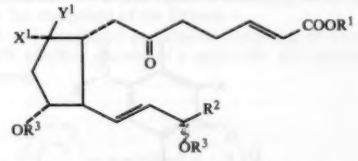
4,296,121

NOVEL PROSTAGLANDIN DERIVATIVES OF THE Δ2-PGF$_2$ AND Δ2-PGE$_2$ SERIES AND PROCESS FOR THEIR MANUFACTURE

Wilhelm Bartmann, Bad Soden am Taunus; Gerhard Beck, Frankfurt am Main; Ulrich Lerch, Hofheim am Taunus, and Elmar Konz, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 2, 1979, Ser. No. 62,937
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834248
Int. Cl.[3] C07D *333/24;* A61K *31/557;* C07D *307/54;* C07C *177/00*
U.S. Cl. 424—275 7 Claims

1. A compound of the formula



wherein:

X^1 and Y^1 taken alone are different and are hydrogen or hydroxy, or taken together are oxygen;

R^1 is

(a) hydrogen or linear or branched, saturated or unsaturated, aliphatic or cycloaliphatic hydrocarbon having up to 10 carbon atoms, or is

(b) a physiologically acceptable metal ion, an NH_4^+ion, or an ammonium ion derived from a primary, secondary, or tertiary amine;

R^2 is linear or branched alkyl having 1 to 7 carbon atoms substituted with

(a) α- or β-thienyl or furyl, which thienyl or furyl in turn may be mono-, di-, or tri-substituted in the nucleus with at least one member selected from the group consisting of halogen, trifluoromethyl, alkyl having 1 to 6 carbon atoms, and alkoxy having 1 to 6 carbon atoms, or

(b) α- or β-thienyloxy or such thienyloxy mono-, di-, or tri-substituted in the nucleus with at least one member selected from the group consisting of halogen, trifluoromethyl, alkyl having 1 to 6 carbon atoms, and alkoxy having 1 to 6 carbon atoms; and

R^3 is hydrogen, 1-ethoxyethyl, tetrahydropyran-2-yl, or tetrahydrofuran-2-yl, or is such tetrahydropyranyl or tetrahydrofuranyl mono- or poly-substituted by alkyl.

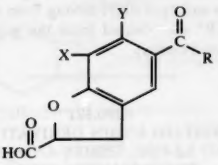
4,296,122

2,3-DIHYDRO-6,7-DISUBSTITUTED-5-(ACYL)BENZOFURAN-2-CARBOXYLIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 678,529, Apr. 20, 1976, Pat. No. 4,087,542, which is a continuation-in-part of Ser. No. 594,839, Jul. 9, 1975, abandoned. This application Jan. 27, 1978, Ser. No. 873,024
Int. Cl.[3] A61K *31/34;* C07D *307/77*
U.S. Cl. 424—285 13 Claims

1. A compound having the formula:



wherein

X is halo, methyl or hydrogen;

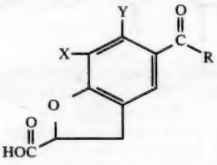
Y is halo or methyl and

X and Y can be combined to form a hydrocarbylene radical of from 3 to 4 carbon atoms;

R is phenyl or mono or disubstituted phenyl wherein the substituent is halo, methyl, trifluoromethyl or methoxy; and

the non-toxic pharmaceutically acceptable salt, ester and amide derivative thereof.

8. A pharmaceutical composition useful in the treatment of edema associated with hypertension comprising a therapeutically effective amount of a compound of the formula of



wherein

X is halo, methyl or hydrogen;

Y is halo or methyl,

X and Y can be combined to form a hydrocarbylene radical of from 3 or 4 carbon atoms,

R is phenyl or mono or disubstituted phenyl wherein the substituent is halo, methyl, trifluoromethyl or methoxy and

the non-toxic pharmaceutically acceptable salt, ester and amide derivative thereof and a pharmaceutically acceptable carrier.

4,296,123

GERMANIUM-CONTAINING ORGANIC POLYMER AND ITS USE IN THE TREATMENT OF OPTHALMOLOGICAL DISORDERS

Akira Ishikawa, Tokyo; Yukihito Ishida, Fujisawa; Shiro Ikegami, Funabashi; Hiroshi Satoh, Tokyo, all of Japan; Ryuichi Sato, 2310, Kamikoizumi, Oizumicho, Ora-gun, Gunma-ken, Japan; Setsuo Tomisawa, Tokyo, Japan, and Shigeru Toyoshima, Funabashi, Japan, assignors to Ryuichi Sato, Gunma, Japan

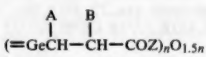
Division of Ser. No. 12,151, Feb. 14, 1979. This application Feb. 29, 1980, Ser. No. 125,948

Claims priority, application Japan, Mar. 1, 1978, 53-1992; Mar. 1, 1978, 53-21993

Int. Cl.[3] **A61K** *31/28*

U.S. Cl. 424—287 **1 Claim**

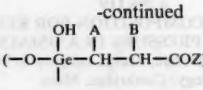
1. A method of treating an animal suffering from eye cataracts, which comprises; administering to said animal an effective amount to relieve said suffering, of a polymer selected from those of the formulae:



(III)

and

-continued



(IV)

wherein A represents one of a hydrogen atom, an alkyl having 1 to 3 carbon atoms, —COOH, —COOR (wherein R is alkyl having 1 to 3 carbon atoms), B represents one of a hydrogen atom or an alkyl having 1 to 3 carbon atoms; Z represents one of a hydroxy, an alkoxy group having 1 to 3 carbon atoms or an alkyl having 1 to 3 carbon atoms; and n is an integer greater than 3, inclusive.

4,296,124

PHARMACEUTICAL METHODS

Mario Ghelardoni; Vittorio Pestellini; Piero Del Soldato; Giovanna Volterra, and Alberto Meli, all of Florence, Italy, assignors to A. Menarini S.A.S., Italy

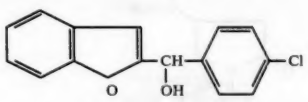
Filed Aug. 11, 1980, Ser. No. 176,867

Claims priority, application Italy, Aug. 10, 1979, 9513 A/79

Int. Cl.[3] **A61K** *31/34*

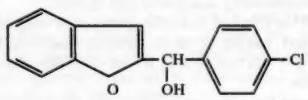
U.S. Cl. 424—285 **4 Claims**

1. A method of causing normolipidemia in mammals by administering a normolipidemic amount of the compound (2-benzofuryl)-(p-chlorophenyl)-carbinol of formula I:



(I)

2. A method of decreasing platelet binding in mammals by administering an effective amount of the compound (2-benzofuryl)-(p-chlorophenyl)-carbinol of formula I:



(I)

4,296,125

DERIVATIVES OF BENZOYLPHENOXYALKANOIC ACIDS HAVING NORMOLIPEMIZING ACTIVITY

Valerio Borzatta; Manlio Cristofori; Mauro Morotti, all of Bologna, and Giuseppe Mascellani, Calderino di M.S. Pietro, all of Italy, assignors to Alpha Farmaceutici S.p.A., Italy

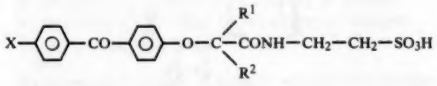
Continuation of Ser. No. 29,006, Apr. 11, 1979, abandoned. This application Feb. 21, 1980, Ser. No. 123,454

Claims priority, application Italy, May 9, 1978, 3426 A/78; Dec. 21, 1978, 3630 A/78

Int. Cl.[3] **A61K** *31/185;* **C07D** *143/53*

U.S. Cl. 424—315 **5 Claims**

1. A compound of the formula:



wherein:

X represents an atom of chlorine, bromine, iodine, or an alkyl group having 1 to 4 carbon atoms; and

R^1 and R^2, equal or different from each other, represent a hydrogen atom or an alkyl group or a hydroxyalkyl

group, said groups having 1 to 6 carbon atoms; or a pharmaceutically acceptable salt of said compound.

5. A pharmaceuitcal preparation useful in the therapy of hyperlipaemia or of hypercholesterolemia, characterized in that it contains a hypolipaemic or hypocholesterolemic effective dose of at least one of the compounds of claim **1** associated or combined with one or more usual excipients or solvents.

4,296,126

3-ARYLOXY-3-ARYL-PROPANEAMINES AND THEIR METHOD OF USE

Lucien Nedelec, Le Raincy; Daniel Frechet, Paris, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

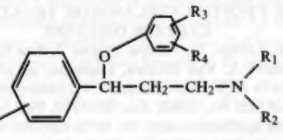
Filed Feb. 22, 1979, Ser. No. 13,831

Claims priority, application France, Feb. 24, 1978, 78 05335

Int. Cl.[3] **A01N** *37/30;* **A61K** *31/135;* **C07C** *93/02*

U.S. Cl. 424—316 **22 Claims**

1. A compound selected from the group consisting of benzene-propanamines of the formula



wherein X is selected from the group consisting of hydrogen, chlorine, fluorine and bromine, R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R_2 is alkyl of 1 to 5 carbon atoms, R_3 is selected from the group consisting of hydrogen, chlorine, bromine, $-CF_3$, methyl and methoxy and R_4 is nitro and their non-toxic, pharmaceutically acceptable acid addition salts.

14. A method of curbing the appetite of warm-blooded animals comprising administering to warm-blooded animals an anorexigically effective amount of at least one compound of claim **1**.

4,296,127

MIXED SALTS OF ESSENTIAL OR SEMI-ESSENTIAL AMINO ACIDS AND NITROGEN-FREE ANALOGS THEREOF

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Apr. 18, 1979, Ser. No. 31,274

Int. Cl.[3] **A01N** *37/12;* **C07C** *101/30, 101/08*

U.S. Cl. 424—319 **13 Claims**

1. Compound of the formula:

$$AN.xH_2O$$

wherein A is selected from the group consisting of essential amino acids and semi-essential amino acids, N is selected from the group consisting of alpha-keto and alpha-hydroxy analogs of essential or semi-essential amino acids, but when A is L-ornithine or L-arginine, N is not an alpha-keto analog of a branched chain essential amino acid, and x may be zero or a positive number which need not be an integer.

10. A composition useful for providing essential and/or semi-essential amino acids to the body, comprising a mixture of two or more compounds of the formula of claim **1**, at least one of said compounds being other than the reaction product of the semi-essential amino acid L-ornithine or L-arginine with an alpha-keto analog of a branched chain essential amino acid.

4,296,128

CARBOXYLIC ACID HYDRAZIDES AND PROCESSES FOR THEIR MANUFACTURE

Alfred Sallmann, and Richard Göschke, both of Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

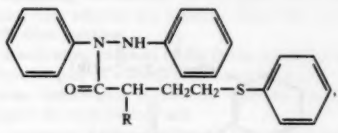
Filed May 7, 1980, Ser. No. 147,458

Claims priority, application Switzerland, May 11, 1979, 4416/79

Int. Cl.[3] **C07C** *149/43;* **A61K** *31/24, 31/195*

U.S. Cl. 424—309 **3 Claims**

1. A new carboxylic acid hydrazide of the formula

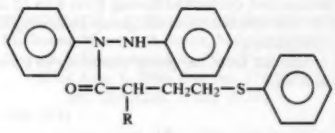


(I)

in which

R represents carboxy, or a pharmaceutically acceptable salt of the compound of the formula I.

3. A pharmaceutical preparation containing an antithrombotically effective amount of a carboxylic acid hydrazide of the formula



wherein R represents carboxy or a pharmaceutically acceptable salt thereof, lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, together with one or more pharmaceutically acceptable carriers.

4,296,129

(CARBOXYACYLAMINO)PHENYLALKENAMIDES AND ESTERS THEREOF AS SRS-A ANTAGONISTS

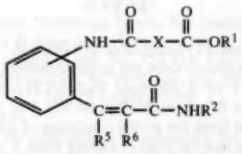
Saul B. Kadin, New London, Conn., assignor to Pfizer, Inc., New York, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,894

Int. Cl.[3] **A61K** *31/24;* **C07C** *101/447, 101/453*

U.S. Cl. 424—309 **27 Claims**

1. An alkenamide compound of the formula



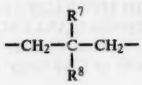
and the pharmaceutically-acceptable salts thereof;

wherein R^1 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons, and $-CH_2-CH_2-NR^3R^4$, wherein R^3 and R^4 are each alkyl having 1 to 3 carbons;

R^2 is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons;

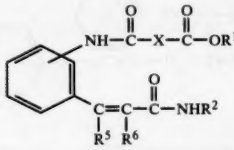
R^5 and R^6 are selected from the group consisting of hydrogen and methyl;

and X is selected from the group consisting of cis-vinylene, ethylene and

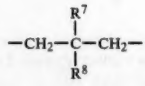


wherein R^7 and R^8 are each selected from the group consisting of hydrogen and methyl.

26. The method of antagonizing the effect of slow-reacting substance of anaphylaxis in a human subject, which comprises administering thereto a slow-reacting substance of anaphylaxis antagonizing amount of an alkenamide compound of the formula

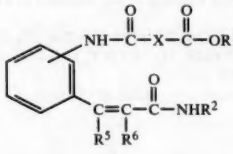


or a pharmaceutically-acceptable salt thereof;
wherein R^1 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons, and $-CH_2-CH_2-NR^3R^4$, wherein R^3 and R^4 are each alkyl having 1 to 3 carbons;
R^2 is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons;
R^5 and R^6 are selected from the group consisting of hydrogen and methyl;
and X is selected from the group consisting of cis-vinylene, ethylene and

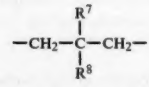


wherein R^7 and R^8 are each selected from the group consisting of hydrogen and methyl.

27. A pharmaceutical composition, which comprises a pharmaceutically-acceptable carrier and an alkenamide compound of the formula



or a pharmaceutically-acceptable salt thereof;
wherein R^1 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons, and $-CH_2-CH_2-NR^3R^4$, wherein R^3 and R^4 are each alkyl having 1 to 3 carbons;
R^2 is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons;
R^5 and R^6 are selected from the group consisting of hydrogen and methyl;
and X is selected from the group consisting of cis-vinylene, ethylene and



wherein R^7 and R^8 are each selected from the group consisting of hydrogen and methyl;
and wherein the ratio of the pharmaceutically-acceptable carrier to the alkenamide compound is in the range from 1:6 to 6:1 by weight.

4,296,130

METHYLSULFONYLMETHANE AND METHODS OF USE

Robert J. Herschler, 3080 NW. 8th St., Camas, Wash. 98607

Filed Aug. 30, 1979, Ser. No. 71,068
Int. Cl.³ A61K *31/10*
U.S. Cl. 424—337 **2 Claims**

1. A method of extending the blood supply of a warm blooded animal which method comprises:
intravenously introducing into the blood of said warm blooded animal requiring such treatment a blood diluent comprising an aqueous solution of methylsulfonylmethane, present in an amount of about 0.1-50 weight percent.

4,296,131

PHARMACEUTICAL COMPOSITIONS AND THEIR USE IN THE PROPHYLAXIS AND/OR TREATMENT OF CERTAIN DISEASES

Cornelis A. Ladage, De Meern; Douwe J. Van Linge, Eemnes, and Huibert A. Van Riessen, Lunteren, all of Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

Division of Ser. No. 3,968, Jan. 16, 1979, Pat. No. 4,250,089.
This application Aug. 10, 1979, Ser. No. 65,627
Claims priority, application Netherlands, Jan. 20, 1978, 7800762
Int. Cl.² A61K *31/055, 47/00*
U.S. Cl. 424—347 **8 Claims**

1. A pharmaceutical composition for the treatment of distomatosis, comprising an amount, effective against distomatosis, of a member selected from the group consisting of 4,4'-dichloro-6,6'-dinitro-o,o'-bisphenol; 4,4',6,6'-tetrabromo-o,o'-bisphenol; 4,6'-dichloro-4,6'-dinitro-2,2'-methylenediphenol; and 6-bromo-4'-fluoro-4,6'-dinitro-2,2'-methylenediphenol, dissolved in a solvent vehicle comprising 5 to 50 w/v percent of dimethylsulfoxide (DMSO) in combination with a symmetric or unsymmetric ester of adipic acid wherein both alkyl groups together contain six to twelve carbon atoms and wherein the smaller alkyl group present if said ester is unsymmetric contains at least two carbon atoms.

4,296,132

DOG FOOD OF IMPROVED ACCEPTABILITY

Charles R. Lazarus, Ossining; Howard D. Stahl, Hartsdale, both of N.Y., and Gerhard J. Haas, Woodcliff Lake, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 13, 1980, Ser. No. 129,875
Int. Cl.³ A23K *1/00, 1/18*
U.S. Cl. 426—2 **9 Claims**

1. An improved, nutritionally-balanced dog food comprising fat, protein, carbohydrates, vitamins and minerals wherein the improvement consists of magnesium oleate in admixture with at least a portion of the fat, the magnesium oleate being present in an amount effective to improve the palatability of the dog food for dogs.

4,296,133

METHOD FOR PRODUCING BREAD

Kenji Tanaka, Kawagoe, and Shigeru Endo, Tokyo, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1979, Ser. No. 70,321
Int. Cl.³ A21D *2/08, 8/02*
U.S. Cl. 426—23 **13 Claims**

1. A method for producing bread which comprises kneading

a dough together with (a) 3 to 30 ppm of an additive selected from the group consisting of L-ascorbic acid, dehydroascorbic acid and salts thereof, and (b) 5 to 60 ppm of an additive selected from the group consisting of malic acid, α-ketoglutaric acid, tartaric acid, asparagic acid, glutamic acid, hydroxy-oxalic acid, oxo-succinic acid, diamino-succinic acid, γ-hydroxy-glutamic acid and salts thereof; or 5 to 80 ppm of methionine; or 10 to 60 ppm of an alum; or 5 to 70 ppm of a nicotinic acid, wherein all amounts are based on the weight of wheat flour, allowing the thus kneaded dough to ferment, and then baking the thus fermented dough.

4,296,134

LIQUID EGG BLEND

Wayne A. Boldt, S. 66 W20230 Tans Dr., Muskego, Wis. 53150

Continuation of Ser. No. 569,607, Apr. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 469,476, May 13, 1974, abandoned. This application Mar. 8, 1977, Ser. No. 786,301

Int. Cl.³ A23L *1/32*

U.S. Cl. 426—250 **30 Claims**

1. A substantially fat-, oil,- cholesterol- and yolk-free fresh egg product with a maximum of 80 calories per 100 grams, a protein concentration of from 7.5 to 19 percent by weight and a maximum water content of about 1.3 times that found in fresh egg whites and which comprises from 60 to 96 parts by weight of liquid natural egg whites, zero to 18 parts by weight of added water, 2.0 to 10.5 parts by weight of egg-yolk-protein replacement, whereby said protein replacement with said natural egg whites provide combined protein-containing essential amino acids in approximately the same respective proportions as they occur in fresh whole eggs, 0.2 to 0.95 part by weight of stabilizer, 0.1 to 2.5 parts by weight of flavoring and 0.01 to 0.20 part by weight of coloring, which blend is useful, without reconstitution, for preparing scrambled eggs or omelets in the same manner as employed for whole fresh eggs and wherein said egg product, after doubler-boiler cooking, has a syneresis value of less than about 4 percent.

4,296,135

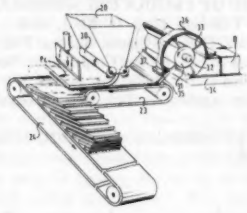
METHOD OF FORMING A LAYER OF PRE-DETERMINED THICKNESS FROM A FEEDSTOCK OF BUTTER OR MARGARINE

Jacques P. Rutten, Tilburg, Netherlands, assignor to Machinefabriek C. Rijkaart B.V., Asperen, Netherlands

Filed Jun. 6, 1979, Ser. No. 45,999

Int. Cl.³ A21D *13/00;* **A23C** *15/00*

U.S. Cl. 426—275 **7 Claims**



1. A method of forming a layer of a desired thickness of a substance which is butter or margarine, from a feedstock of said substance of any shape characterized by repeatedly scraping off an amount from said feedstock and by subsequently severing a portion of the desired thickness from said amount, after which the portions are joined in order of succession to form the desired layer.

4,296,136

COCONUT POWDER

Salvatore F. Ziccarelli, Downers Grove; Rey C. Ramos, and Robert M. Brown, both of Chicago, all of Ill., assignors to Beatrice Foods Company, Chicago, Ill.

Filed Feb. 1, 1980, Ser. No. 117,797

Int. Cl.³ A23L *1/221*

U.S. Cl. 426—533 **23 Claims**

1. A process for producing reconstitutable natural coconut flavor comprising:

(1) grinding coconut meat to an average particle size of 2000 microns or less and until a pulp containing coconut flavor liquor is obtained;

(2) separating the coconut flavor liquor from the coconut meat fiber wherein the separated liquor has no more than 2% fiber therein;

(3) deactivating enzymes in the flavor liquor by heating the flavor liquor at a temperature and for a time within enzyme deactivation conditions, whereby enzymes in the liquor are deactivated; and

(4) concentrating the deactivated liquor to a concentrated form by at least one step selected from (a) condensing the liquor to more than 25% solids, or (b) spray-drying the liquor to a free-flowing powder;

whereby a concentrated coconut flavor is obtained.

4,296,137

FLAVORING WITH 1-ETHOXY-1-ETHANOL ACETATE

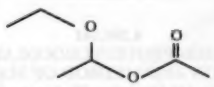
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 7, 1980, Ser. No. 176,111

Int. Cl.³ A23L *1/226, 1/235*

U.S. Cl. 426—534 **3 Claims**

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of foodstuff and chewing gum, comprising the step of adding to said consumable material from 0.05 p.p.m. up to about 500 p.p.m. of 1-ethoxy-1-ethanol acetate having the structure:



4,296,138

FLAVORING WITH 1-N-BUTOXY-1-ETHANOL ACETATE

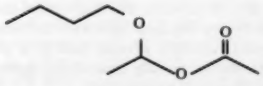
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 176,111, Aug. 7, 1980. This application Dec. 18, 1980, Ser. No. 217,810

Int. Cl.³ A23L *1/226*

U.S. Cl. 426—534 **3 Claims**

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of foodstuff and chewing gum, comprising the step of adding to said consumable material from 0.05 p.p.m. up to about 500 p.p.m. of 1-n-butoxy-1-ethanol acetate having the structure:



4,296,139

BITTERING AGENTS

Riaz A. Khan, Sonning, and Michael R. Jenner, Pangbourne, both of England, assignors to Talres Development (N.A.) N.V., Curacao, Netherlands Antilles

Filed Oct. 17, 1979, Ser. No. 85,402
Claims priority, application United Kingdom, Oct. 18, 1978, 41115/78
Int. Cl.[3] A23L *1/226, 2/00, 2/02*
U.S. Cl. 426—536 8 Claims

1. In a method of bittering a substance by incorporating therein an effective amount of a bittering agent, the improvement which comprises employing 2,6,1',6'-tetrachloro-2,6,1',6'-tetradeoxymannosucrose as said bittering agent.

4,296,140

MOLDED GELLED PIMIENTO BODY

Jack B. Jaquith, Modesto, and Allen R. Church, Madera, both of Calif., assignors to Tri/Valley Growers, San Francisco, Calif.

Continuation-in-part of Ser. No. 775,556, Mar. 8, 1977, abandoned, and Ser. No. 946,115, Sep. 27, 1978, abandoned. This application May 27, 1980, Ser. No. 153,220
Int. Cl.[3] A23L *1/04*
U.S. Cl. 426—575 10 Claims

1. A molded gelled body produced by gelling a composition in calcium chloride, the composition comprising a mixture of macerated pimiento flesh, a water soluble alginate, at least one of the substances starch and a vegetable gum, and an acid, said pimiento flesh constituting the major ingredient by weight, the alginate being present in quantity such that upon cooling and subjecting said mixture to contact with the aqueous calcium chloride solution it will quickly gel the mixture, the starch or gum being present in quantity sufficient to result in a gel which can be manipulated without structural damage and the acid being present in quantity sufficient to provide a pH not exceeding about 4.5, and wherein the molded gelled body is characterized by dimensional stability such that after storage for two days in a brine containing 7% sodium chloride, 0.5% lactic acid and 500 to 1000 ppm calcium chloride it exhibits substantially no change in shape and dimensions.

4,296,141

CONCHLESS HIGH PROTEIN CHOCOLATE FLAVORED COMPOSITION AND METHOD OF MAKING SAME

Potito U. de Paolis, 131 Groverton Pl., Los Angeles, Calif. 90024

Filed Aug. 27, 1979, Ser. No. 69,857
Int. Cl.[3] A23G *1/00;* A23D *5/00*
U.S. Cl. 426—613 8 Claims

1. A method of making a conchless chocolate composition which comprises:

initially admixing at least the following ingredients:

(a) 5–40 parts, by weight, edible fats;

(b) 40–70 parts, by weight, sweetener selected from the group consisting of a sugar and a sugar substitute;

(c) 2–60 parts, by weight, flavoring selected from the group consisting of cocoa powder and carob powder; and

(d) 3–40 parts, by weight, of soya protein isolate;

to form a viscous paste;

admixing with said viscous paste additional edible fats to form a liquified admixture having a total fat content of between 10–65 parts, by weight;

heating said liquid admixture to a temperature of between about 110° F. and 140° F. for a period of time of between about 10 and 30 minutes, under agitation; and

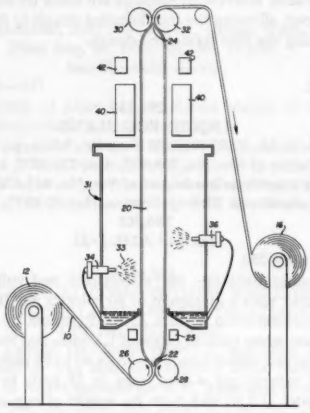
cooling said heated liquified admixture to form said conchless chocolate product wherein said soya protein isolate acts as essentially the sole emulsifying agent for the said conchless chocolate composition.

4,296,142

METHOD FOR COATING A TUBULAR FOOD CASING

Ganapathy Vasudevan, Bolingbrook, and Stanley Lustig, Park Forest, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 919,067, Jun. 26, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,434
Int. Cl.[3] B05D *1/06*
U.S. Cl. 427—28 17 Claims



1. A continuous process for forming a pin-hole free layer on the exterior surface of a flexible tubular cellulosic food casing, comprising the steps of:

establishing a path for processing said food casing;

providing two sets of pinch rollers at spaced apart locations along said path so that said food casing can move through said set of pinch rollers continuously while being maintained in a pinched state;

maintaining an inflated section of said food casing in tension between said sets of pinch rollers;

electrostatically coating a portion of said food casing section with dry particles of a resinous polymeric material having an average particle size of less than 125 microns to establish a coating having a thickness of at least about 0.5 mil;

moving said food casing along said path so that the coated portion of said food casing moves to a location for sintering between said sets of pinch rollers; and

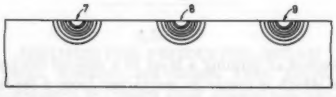
sintering said coated portion to form said layer.

4,296,143

METHOD OF PRODUCING MICROLENSES

Adrianus J. J. Franken; Giok D. Khoe, both of Eindhoven, Netherlands, and Dieter Küppers, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1979, Ser. No. 82,394
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913843
Int. Cl.[3] G02B *1/10, 3/00;* C03C *17/02*
U.S. Cl. 427—38 6 Claims



1. A method of producing microlenses embedded in a glass plate, characterized in that rotation-symmetrical recesses are produced in a glass plate, whereafter vitreous layers are depos-

ited on the plate by means of a vapour deposition process until the recesses are fully filled up, whereafter the thickness of the coated glass plate is reduced to the original value or to a lower value.

4,296,144

ION IMPLANTED STYLUS

Edward W. Maby, Plainsboro; Hirohisa Kawamoto, Princeton, and Pierre V. Valembois, Cranbury, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1980, Ser. No. 142,982
Int. Cl.³ C23C *11/00*
U.S. Cl. 427—38 **8 Claims**

1. In a method for fabricating a playback stylus which comprises a diamond dielectric support element for use with a capacitive information system including a high density information conductive disc which comprises the steps of forming a bottom surface for contacting the disc and preparing a conductive layer adjacent to the bottom surface by ion implanting a portion of the diamond dielectric support element;

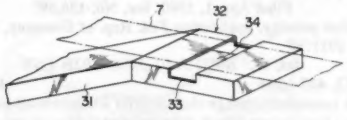
the improvement comprising the additional step of annealing the ion implanted diamond at from about 850° to about 1500° C.

4,296,145

METHOD FOR COATING ONE SIDE ONLY OF STEEL STRIP WITH MOLTEN COATING METAL

Seizun Higuchi, Kitakyushu; Kazuhiro Tano, Nakama; Minoru Kamada, and Susumu Okamoto, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 108,154
Claims priority, application Japan, Dec. 30, 1978, 53/165280
Int. Cl.³ B05C *3/18;* **C23C** *1/02*
U.S. Cl. 427—47 **11 Claims**



1. In a method of continuously coating one side only of a steel strip with a molten coating metal including the steps of:

(1) passing the steel strip to be coated substantially horizontally above a bath of the molten coating metal, with guide rolls imposing longitudinal tension thereon, through a chamber containing a molten metal coating bath, the chamber being filled with a nonoxidizing atmosphere,

(2) forcing the molten coating metal via an electromagnetic pump up from a submerged inlet of an adjacent molten metal guide to an outlet opening positioned above the molten coating metal bath surface forming a rising stream of the coating metal on the exit side of the outlet, and

(3) contacting the rising metal stream with the bottom surface of the substantially flat steel strip to be coated,

the improvement comprising positively flowing the molten coating metal toward both edges of the substantially horizontal flat strip by passing the molten metal through the metal guide outlet offering less flow resistance to the rising molten metal stream on the exit side of the guide outlet along the width thereof and offering greater flow resistance to the rising molten metal along the length thereof with respect to the running strip, thus positively forcing the flow of molten metal out to both edges of the substantially horizontal, flat strip; and thereby forming a uniform layer of the coating metal on the bottom side of the strip thus contacted with the metal while preventing the coating metal from flowing over to the opposite noncoated side of the steel strip.

4,296,146

METHOD FOR REMOVING RESIST LAYER FROM SUBSTRATE WITH COMBUSTIBLE GAS BURNOFF

Thomas C. Penn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 2, 1977, Ser. No. 856,900
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—58 **16 Claims**

1. In the fabrication of an electronic structure including a layer of semiconductor material and at least one electronic device formed thereon, wherein a patterned layer of resist material is disposed on a surface of different material than the resist material, a method of removing the patterned layer of resist material from the surface of different material, said method comprising:

decomposing resist material via chemical reaction from said layer of resist material by exposing said layer of resist material to the flame of a combustible gas, wherein the flame contains resist-attacking reactive products;

retaining the structure including the surface of different material in a condition, which is essentially unaltered physically and chemically with respect to its condition prior to the exposure of the layer of resist material to the flame of the combustible gas, during the decomposition of resist material; and

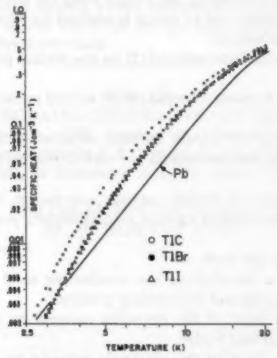
discontinuing the exposure of the structure to the flame of the combustible gas when only said layer of resist material has been removed by decomposition of the resist material thereof while the structure including the surface of different material remains in its unaltered condition.

4,296,147

THALLOUS HALIDE MATERIALS FOR USE IN CRYOGENIC APPLICATIONS

William N. Lawless, 518 Illinois Ct., Westerville, Ohio 43081, assignor to William Nicholas Lawless, Westerville, Ohio

Filed May 21, 1979, Ser. No. 41,039
Int. Cl.³ D02G *3/00*
U.S. Cl. 427—120 **6 Claims**



1. A structured, ceramic, dielectric, heat exchange material for use in cryogenic applications having a specific heat equal to or greater than that of lead at temperatures below about 20° K. comprising a mixture of components X and Y,

where X is selected from the group consisting of thallous fluoride, thallous chloride, thallous bromide, and thallous iodide, and

where Y is selected from the group consisting of thallous fluoride; thallous chloride; thallous bromide; thallous iodide; epoxy resin; AB_2O_4, where A is a Group IIB metal ion with or without other divalent metal ions and B is chromium ion with or without other trivalent metal ions; AB_2O_6, where A is manganese or nickel ion or both, with

or without other divalent metal ions and B is niobium, tantalum, or both; and A_2BCO_6, where A is lead ion with or without other divalent metal ions, B is gadolinium or manganese with or without other trivalent metal ions, and C is niobium, tantalum, or both, with the proviso that X and Y cannot be the same compound.

4,296,148

METHOD TO APPLY MULTIPLE LAYERS, INCLUDING AN ELECTRODE LAYER, ON A SINTERED OR PRE-SINTERED ION CONDUCTIVE SOLID ELECTROLYTE BODY

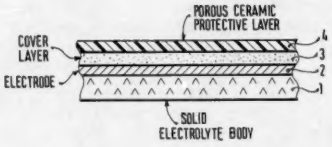
Karl-Hermann Friese, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,602

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852647

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—125 **24 Claims**



1. Method of making a solid electrolyte ion conductive gas sensing element having

a solid ion conductive electrolyte body **(1)** having two surface portions, one of which is adapted for exposure to the gas to be sensed

a layer of electrode material **(2)** on one surface portion of the body;

a layer of electrode material on the second surface portion of the body;

a cover layer of porous ceramic material on the layer of electrode material on said one surface portion of the body; and

a cover layer of porous ceramic material on the layer of electrode material on said second surface portion of the body,

comprising the steps of

providing a pre-sintered ion conductive solid electrolyte body having said two surface portions,

applying a layer of the electrode material on one surface portion of said body;

applying a layer of the electrode material on the second surface portion of said body;

applying a cover layer of ceramic material which, when sintered, becomes porous, on the layer of electrode material on one surface portion of said body;

applying a cover layer of ceramic material which, when sintered, becomes porous on the layer of electrode material on the second surface portion of said body; and

then in one step, sintering the electrode layers and the cover layers, by heating the body with the electrode layers and the cover layers applied thereon to a temperature in which the sintering process of the electrode layers at least commences and the ion conductive body and the cover layer are completely sintered.

4,296,149

MANUFACTURE OF ACICULAR COBALT-CONTAINING MAGNETIC IRON OXIDE

Peter Rudolf, Neuhofen; Werner Steck, Mutterstadt; Helmut Jakusch, Frankenthal; Guenter Vaeth, Limburgerhof, and Christof Jaeckh, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,552

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1979, 2905351

Int. Cl.³ C01G *49/06*

U.S. Cl. 427—130 **1 Claim**

1. A process for the manufacture of acicular, magnetic iron oxide consisting of a core of gamma-iron(III) oxide surrounded by a ferrite shell which contains, based on the amount of magnetic material, from 0.2 to 12 percent by weight of cobalt(II) ions and from 0.1 to 15 percent by weight of iron(II) ions, which process comprises: suspending acicular gamma-iron(III) oxide in water, adding to said suspension an aqueous solution containing cobalt(II) ions, followed by the addition of an aqueous base to bring the pH to not less than 10, both additions being made at room temperature, thereafter introducing an aqueous solution containing iron(II) ions under an inert gas atmosphere, with continued stirring, and after the cobalt(II) hydroxide and iron(II) hydroxide has precipitated under the inert gas atmosphere, the solid product is filtered off, washed neutral with water and heated at from 100° to 200° C. for from one to seven hours, the steps of stirring, precipitating and filtering all taking place at room temperature.

4,296,150

TRANSPARENT IMAGE MARKING SHEET FOR PROJECTION SYSTEMS

Norbert Mecke; Franz U. Schmitt; Karl-Heinz Schrader, and Heinke Blutschkau, all of Hanover, Fed. Rep. of Germany, assignors to Pelikan A.G., Hanover, Fed. Rep. of Germany

Filed Apr. 1, 1980, Ser. No. 136,397

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911798

Int. Cl.³ B05D *3/10, 5/06;* **G02B** *1/10*

U.S. Cl. 427—164 **12 Claims**

1. A transparent image sheet carrier for overhead-projection systems based upon a dark-tone colored field with image markings in bright-tone contrasting colors, comprising a sheet bearing a layer containing at least one acid-resistant dye for imparting said dark-tone color to said field, said dye being dischargeable in the locale of said image markings by discharge means with a simultaneous appearance in said image locale of said bright-tone contrasting color.

9. A method of preparing acid-resistant transparent image bearing sheets for overhead projection systems based upon bright-colored images upon a contrasting dark-tone colored field, which comprises the steps of:

providing a transparent substrate sheet bearing a dark-tone color field layer, said color being based upon a dischargeable transparent dark tone dye, and

forming localized images on said field by the application to said image locale of a discharge agent to locally discharge said field dye with the simultaneous appearance in said discharged image locale of the bright-colored contrasting image.

4,296,151

FLUORINATED POLYMERIC SURFACES

Harold D. Boultinghouse, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 968,713, Dec. 12, 1978, abandoned. This application Jun. 12, 1980, Ser. No. 158,768

Int. Cl.³ B05D *3/00, 3/12*

U.S. Cl. 427—255.1 **10 Claims**

1. A process for treating a polymeric surface formed from (1) normally solid polymers of aliphatic mono-1-olefins and (2)

elastomeric and resinous copolymers of conjugated dienes and vinyl-substituted aromatic compounds which comprises contacting said surface with a fluorine-containing gas under conditions and for a period of time sufficient to render said surface water-wettable and receptive to adherence of a second material selected from adhesives, coatings, paints, inks, decorations, and the like, and then contacting said surface with said second material under conditions which cause said second material to adhere to said fluorinated surface.

4,296,152

METHOD AND COMPOSITION FOR TREATING WOOD WITH PENTACHLOROPHENOL

Roy P. Kirchner, Tallahassee, Fla., assignor to Idacon, Inc., Houston, Tex.

Filed May 8, 1980, Ser. No. 135,992
Int. Cl.³ C09D *5/16, 5/18;* **B05D** *1/18, 3/00*
U.S. Cl. 427—440 **2 Claims**

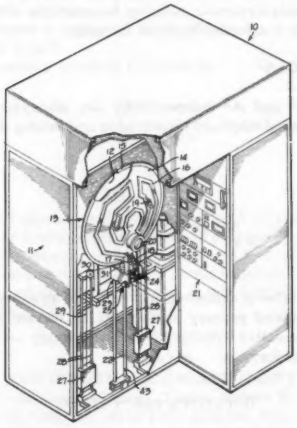
1. A method of impregnating wood with pentachlorophenol comprising the steps of preparing a solution of about 25 to 55 percent by weight of pentachlorophenol in an organic solvent comprising a petroleum fraction at least 50% of which will distill above 485° F., preparing a finely divided dispersion of the solution in water in which the pentachlorophenol content is from 0.1 to 10 percent by weight, and impregnating wood with the dispersion.

4,296,153

VACUUM CHAMBER DOOR ASSEMBLY AND METHOD

Gunard O. B. Mahl, San Francisco, Calif., assignor to CHA Industries, Menlo Park, Calif.

Filed May 15, 1978, Ser. No. 906,025
Int. Cl.³ B05D *3/00*
U.S. Cl. 427—444 **30 Claims**



1. An apparatus comprising a cabinet defining a vacuum chamber therein, and a door assembly movably mounted on said cabinet to normally close an opening to said vacuum chamber, the improvement comprising mounting means mounting said door assembly on said cabinet (1) for initial pivotal movement between a closed position normally closing the opening to said vacuum chamber and an open position pivoted outwardly away from said vacuum chamber for fully exposing said opening, and (2) for further movement, following and independent of said pivotal movement, to a position remote from said opening.

22. A method for loading and unloading a vacuum chamber defined in an apparatus with at least one article to be processed comprising the steps of

movably mounting a door assembly on said apparatus for movement between closed and opened positions relative to said chamber,

pivoting said door assembly away from said chamber,

moving said door assembly vertically downwardly to a remote, lowered position vertically below said chamber,

placing an article to be processed in said chamber,

moving said door assembly vertically upwardly to a raised position, and

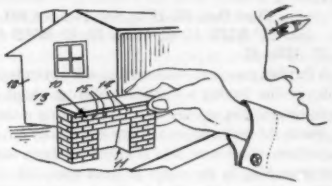
pivoting said door assembly inwardly into closed and sealed relationship with respect to said chamber.

4,296,154

STRIP BRICK FACING MATERIAL

Robert B. Ibberson, Gingerbread Hill, Arlington, Vt. 05250

Filed Feb. 8, 1980, Ser. No. 120,004
Int. Cl.³ B44F *9/04*
U.S. Cl. 428—15 **3 Claims**



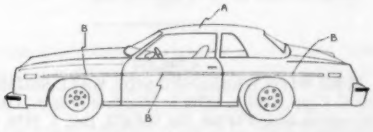
1. A simulated brick facing for application to a supporting member including individual strips, each simulating a layer of brick, at least one longitudinal groove along at least one side of each strip simulating the horizontal, recessed mortar layer between layers of brick, transverse grooves simulating vertical, recessed mortar bonds between side-by-side bricks, said grooves defining raised lands simulating the visible faces of individual bricks, side walls of both said longitudinal and transverse grooves being entirely substantially perpendicular to the lands and the groove bottoms and being entirely free of any undercuts therein into the body of the simulated bricks, said individual strips having planar undersurfaces adapted to be applied one above the other to the supporting member to represent a brick structure.

4,296,155

OVERCOATED DECORATIVE MOULDING

Ciro N. Madonia, 1390 Beaufort Dr., Burlington, Ontario; Christopher Hatzikelis, R.R. 1, Palgrave, Ontario, and Cesare C. Cosentino, 45 Grandview Ave., Thornhill, Ontario, all of Canada

Filed Oct. 16, 1979, Ser. No. 85,276
Int. Cl.³ B32B *3/02, 31/30*
U.S. Cl. 428—31 **6 Claims**



1. An elongated decorative moulding for protecting vehicle bodies from minor impacts, said decorative moulding comprising:

(a) an extruded strip of pliable material having a symmetrical lens shaped cross section with substantially flat first surface and an impact-absorbing outwardly convex second-surface spanning said first surface;

(b) adhesive means carried by said first surface and adapted to fasten said first surface to a vehicle body;

(c) a decorative strip having two major surfaces and two

minor edge surfaces, one major surface being attached to said impact-absorbing second surface, the other major surface having a decorative material thereon, said decorative material being susceptible to weathering at least at the edge surfaces of said decorative strip; and

(d) a transparent weather-resistant acrylic monomer coating overlying at least the edge surfaces and the portion of said decorative strip immediately adjacent each edge surface thereof in sealing relation therewith and connected in sealing relation with the portion of said extruded strip immediately adjacent said decorative strip.

4,296,156

MULTILAYER FILM INCLUDING A POLYURETHANE

Stanley Lustig, Park Forest, and Stephen J. Vicik, Darien, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,501
Int. Cl.³ B32B *27/40*; C08G *18/42*; B65D *81/34*
U.S. Cl. 428—35 **16 Claims**

1. A flexible puncture resistant biaxially oriented coextruded multilayer film having a thickness of from about 2.0 to about 3.5 mils comprising at least one layer having a thickness of at least about 0.5 mil and consisting essentially of an aromatic polyurethane elastomer, said film having been subjected to a biaxial stretching in the range of from about 12 to about 18.

7. The multilayer film of claim **1**, wherein said film has a first outer layer of a heat sealable polymer; a first core layer connected to said first outer layer and serving as an oxygen barrier; a second core layer of said aromatic polyurethane connected to said first core layer; and a second outer layer connected to said second core layer of a biaxially orientable polymer which adheres to said aromatic polyurethane.

10. A flexible puncture resistant biaxially oriented coextruded multilayer film having a thickness of from about 2.0 to about 3.5 mils, comprising:

a first outer layer of ethylene vinyl acetate copolymer having a vinyl acetate content of from about 5% to about 18% by weight and having a melt flow of from about 0.2 to about 1.0 decigram per minute;

a first core layer of polyvinylidene chloride copolymer having at least about 50% by weight of a polymerized vinylidene chloride and containing a maximum of about 5% by weight of a plasticizer;

a second core layer of aromatic polyurethane elastomer having a thickness of at least about 0.5 mil; and

a second outer layer of ethylene vinyl acetate copolymer having a vinyl acetate content of from about 5% to about 18% by weight and a melt flow of from about 0.2 to about 1.0 decigrams per minute;

said film having been subjected to a biaxial stretching in the range of from about 12 to about 18.

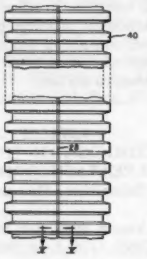
4,296,157

TUBE WITH WEAKENED SIDE WALL SEGMENT

Allen C. Conti, 5294 E. 117th St., Garfield Heights, Ohio 44125

Continuation-in-part of Ser. No. 966,678, Dec. 5, 1978, Pat. No. 4,202,530. This application Mar. 22, 1979, Ser. No. 22,671
Int. Cl.³ D03D *21/00, 49/24*
U.S. Cl. 428—36 **2 Claims**

1. A tubular apparatus to protect a cable from damage comprising an open-ended elongated hollow tube having a side wall with a continuous internal surface of a first thermoplastic material and of substantially uniform thickness throughout except for a narrow arcuate web segment of reduced thickness along substantially the entire length of the tube to create a line of weakness for access to the interior of said tube along a parting line defined by fracturing the arcuate web segment under an applied force, and a coextruded insert of a second thermoplastic material dissimilar to said first thermoplastic



material adhered to the exterior wall surface of said arcuate web segment to maintain said line of weakness.

4,296,158

INFORMATION CARRYING DISCS

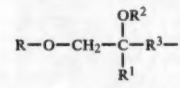
Terry W. Lewis, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 1, 1980, Ser. No. 117,466
Int. Cl.³ B32B *3/02*
U.S. Cl. 428—65 **10 Claims**

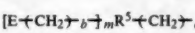
1. An information-carrying element comprising a substrate having adhered to at least one surface thereof a separate layer having a maximum thickness of from 1.0 to 100 μm and a circular or spiral pattern of grooves with or without modulations, depressions, protuberances, said separate layer comprising a polymer layer derived from 15 to 100% by weight of at least one polyacryloyl-containing heterocyclic wherein said heterocyclic is selected from the formulae:

$$A^1—Z—A^2 \quad (I)$$

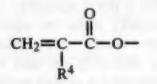
wherein A^1 and A^2 independently are alkoxyalkyl groups having terminal ethylenic unsaturation and having the formula



wherein R—O— is a monovalent residue of an aliphatic terminally unsaturated primary alcohol, ROH, formed by the removal of the active hydrogen from the primary —OH group, R having the formula:



wherein E is



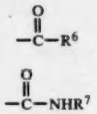
c is an integer of from 1 to 6,

R^1 and R^4 are independently selected from hydrogen and methyl,

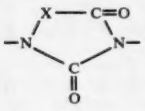
R^5 is an aliphatic group having from 1 to 15 carbon atoms, and no more than two catenary oxygen or carboxy groups, a valence of m+1.

m is an integer of from 1 to 5,

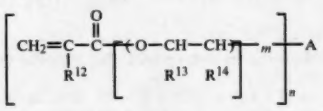
R^2 is selected from hydrogen and groups of the formula



wherein
R^6 is selected from alkyl and alkenyl groups
R^7 is an aliphatic or aromatic group of up to eight carbon atoms,
R^3 is an alkylene group of from 1 to 6 carbon atoms with up to one catenary oxygen atom, and
Z is a heterocyclic group of the formula

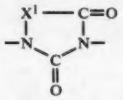


wherein X is a divalent group which is required to complete a 5- or 6-membered heterocyclic ring, or



(2)

wherein
R^{12} and R^{13} independently represent hydrogen or methyl,
R^{14} represents hydrogen, an alkyl group, or a phenyl group,
R^{13} and R^{14} together may represent trimethylene or tetramethylene group,
m represents a number of from 1 to 30,
n is 2 or 3, and
A represents a group of the formula



wherein X^1 represents the divalent radical necessary to complete a 5- or 6-membered heterocyclic ring group, said process comprising exposing said composition to radiation while the composition is in the presence of an atomosphere of at least 2% by volume of oxygen to polymerize said components having formula (1) or (2).

4,296,159

POLYURETHANE BACKED CARPET

Randall C. Jenkines; Clyde G. Taylor; Robert B. Turner, and Donald H. Ridgway, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 29, 1980, Ser. No. 191,590
Int. Cl.³ B32B *3/00, 3/26*
U.S. Cl. 428—95 **40 Claims**

15. A carpet comprising (I) a primary backing; (II) a yarn tufted or woven through said primary backing thereby creating a yarn bundle on the underside of the resultant tufted or woven textile article and (III) a polyurethane composition applied to the underside thereby encapsulating the yarn bundles and adhering the yarn bundles to the primary backing; said polyurethane composition comprising the catalyzed reaction product of a mixture comprising

(A) a relatively high molecular weight polyether polyol having an average of from 2 to about 8 hydroxyl groups per molecule and an average hydroxyl equivalent weight of from about 500 to about 2200 or a mixture of such polyols;

(B) a relatively low molecular weight polyol having an average of from about 2 to about 8 hydroxyl groups per molecule and an average equivalent weight of from about 31 to about 230 or a mixture of such polyols;

(C) an organic polyisocyanate or polyisothiocyanate having an average of from about 2 to about 4 NCX (each X being independently O or S) groups per molecule or a mixture of such isocyanates or isothiocyanates; and

(D) an inorganic filler component; wherein:

(1) components (A) and (B) are present in quantities such that the ratio of the number of hydroxyl equivalents contributed by component (B) to the number of hydroxyl equivalents contributed by component (A) is from about 0.8:1 to about 5.5:1;

(2) components (A), (B) and (C) are present in quantities so as to provide an NCX/OH ratio of from about 0.95/1 to about 1.5/1; with the proviso that the NCX:OH ratio is sufficient to provide a tuft lock value of at least about 12 pounds and the edge curl value is not greater than about 4.1 centimeters at the particular ratio at which components (A) and (B) are employed and the particular equivalent weights at which components (A) and (B) are employed; and

(B 3) component (D) is present in quantities of from about 50 parts to about 300 parts per 100 parts by weight of liquid reactants; and

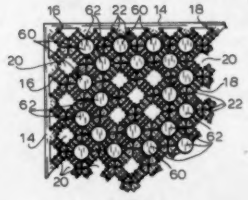
wherein (a) said carpet has a tuft lock of at least about 12 pounds (5.44 kg) and an edge curl of not greater than about 4.1 centimeters and (b) the time required for the catalyzed, filled, unfrothed polyurethane forming mixture to reach a Brookfield viscosity of 20,000 centipoise is greater than about 70 seconds measured from the time the catalyst is added to a mixture of the other components, said catalyst being added when the temperature of the uncatalyzed mixture is about 93° F., ±1° F.

4,296,160

METHOD OF ZONING GRATE SURFACES

Nicholas G. Forlenza, Utica, N.Y., assignor to Mateflex/Mele Corporation, Utica, N.Y.

Filed Jan. 7, 1980, Ser. No. 110,132
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—117 **3 Claims**



1. A method of delineating a zone on a surface of a thermoplastic grating, said grating comprising a molded thermoplastic sheet of a first color having an upper surface and a lower surface, a plurality of support legs on the lower surface and a plurality of square openings in the sheet communicating between upper and lower surfaces, the sheet portions between said square holes being bars defining the edges of adjacent holes, which comprises; inserting in those openings within said zone a removable closure member adapted to interlock with the grating and close the openings, said member having a second color which is visually distinguishable from the first color, said member comprising a cylinder having a first closed end and a second end, and expanded flange portions on each of said first and second ends, said flange portions flaring toward the mid-section of the cylinder shaped member, said interlocking occurring when the flanges frictionally engage the bars.

4,296,161
DRY-FORMED NONWOVEN FABRIC

Paul H. Kaiser, Glenolden; Rudolf Neuenschwander, Swarthmore, both of Pa., and Henry J. Norton, Wilmington, Del., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 93,526, Nov. 13, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 191,235

Int. Cl.³ B32B *5/14*

U.S. Cl. 428—171 **13 Claims**

1. A dry-formed nonwoven fibrous web including a fiber composition which is at least 50%, by weight, wood pulp fibers less than about 0.635 cm (¼ inch) in length with 25% or more of the fiber composition in the web, by weight, being kraft wood pulp fibers, and under 50%, by weight, reinforcing fibers intermixed with the wood pulp fibers throughout the web structure; an embossment in the web providing a plurality of compressed, densified valley regions and less-dense high loft regions, said web including no more than about 5.1 g/m^2 (3.0 lbs per ream of 2,880 ft.^{2}) of a binder and having a cross machine direction wet tensile strength of at least about 0.107 Kg/cm (0.6 lbs./inch).

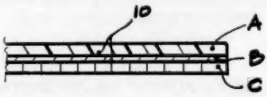
4,296,162
WALLCOVERINGS

Raymond W. Jean, 90 LaSalle St., New York, N.Y. 10027

Continuation-in-part of Ser. No. 886,512, Mar. 14, 1978, Pat. No. 4,205,110. This application Dec. 13, 1979, Ser. No. 103,211

Int. Cl.³ B32B *7/00, 15/04, 15/20*

U.S. Cl. 428—213 **3 Claims**



1. Flexible, unitary, multi-layer surface wallcovering material consisting of an outer layer of opaque vinyl having a thickness of 3 to 5 mils, a second layer of aluminum foil having a thickness of 0.00025 to 0.005 inches, a backing layer of material selected from the group consisting of paper, fabric, confill and scrim, and an adhesive layer between said first and second layers and said second and backing layers, wherein said adhesive is continuous and co-extensive with each adjacent layer such that said layers are laminated together to form a unitary composite structure.

4,296,163
FIBROUS COMPOSITE HAVING ELASTICITY

Shingo Emi, and Noritsugu Saiki, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 20, 1979, Ser. No. 59,238

Claims priority, application Japan, Aug. 1, 1978, 53-93094; Jan. 16, 1979, 54-2165

Int. Cl.³ B32B *7/02*

U.S. Cl. 428—212 **10 Claims**

1. A fibrous composite comprising a coalesced assembly of

(A) a sheet-like mesh structure composed of fibers of a synthetic elastomeric polymer, the individual fibers being interconnected in irregular spaced-apart relationships thereby forming a number of meshes of different shapes and sizes, said mesh structure having

(1) a recovery ratio after 10% stretch of at least 70% in two arbitrarily selected, mutually perpendicular directions on the plane of said mesh structure;

(2) a weight of 10 to 100 g/m^2; and

(3) a fiber density (Fd) of 3 to 100, in which the fiber density (Fd) is calculated in accordance with the following equation:

$$Fd=\tfrac{1}{2}(a+b) \quad (1)$$

wherein a is the number of fibers which cross a straight line formed by connecting two arbitrary points 2 mm apart from each other on the plane of the sheet-like mesh structure (A), and b is the number of fibers which cross a straight line formed by connecting two arbitrary points 2 mm apart from each other on a straight line at right angles to the straight line referred to above with regard to the number of fibers (a); and

(B) a mat-, web- or sheet-like fibrous structure composed of short or long fibers, said fibrous structure having a recovery ratio after 10% stretch of less than 50% in at least one arbitrarily selected direction.

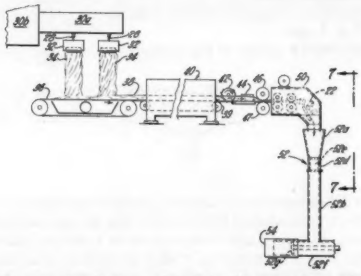
4,296,164
FIBROUS GLASS BLOWING INSULATION AND PROCESS

Richard S. Bemis, Granville, and Daniel A. McCartan, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 52,518, Jun. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 930,946, Aug. 4, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 168,954

Int. Cl.³ B32B *17/00*

U.S. Cl. 428—219 **21 Claims**



1. Blowing insulation comprising fibrous glass prisms, approximate cubes, and flakes of various thicknesses, formed by delamination of columns at random upon handling, the columns having been cut from a generally laminated blanket of bonded glass fibers in such a manner that a maximum dimension of each column initially extends in the direction of a minimum dimension or thickness of the blanket, and the blowing insulation having a product of conductivity (k) and density (d) of less than 0.27 in a blown condition, where (k) is measured in terms of British thermal units/(hour)(square foot)(degree Fahrenheit/inch) at 75 degrees Fahrenheit mean temperature and (d) is measured in terms of pounds per cubic foot (less than 5.37 in a blown condition, where (k) is measured in terms of calories/(hour)(square centimeter)(degree Celsius/centimeter) at 24 degrees Celsius mean temperature and (d) is measured in terms of kilograms per cubic meter).

18. A continuous process of making blowing insulation comprising continuously forming glass fibers from molten glass, spraying the fibers with a thermosetting resin, continuously collecting the sprayed fibers on a moving conveyor to form a continuous generally laminated fibrous glass blanket, conveying the blanket through an oven to cure the binder, cutting the blanket longitudinally into a plurality of strips and cutting the strips generally transversely of but at an angle other

than a right angle to their longitudinal edges into columns in such a manner that a maximum dimension of each column initially extends in the direction of a minimum dimension or thickness of the blanket and the maximum dimension of each column is several times greater than either of two other dimensions measured at right angles to the maximum dimension, and delaminating the columns by subjecting them to further handling to effect the breaking up thereof at random into smaller prisms, approximate cubes, and flakes of various thicknesses.

4,296,165

ANTISTATIC NATURAL AND SYNTHETIC TEXTILE MATERIALS WHICH HAVE BEEN TREATED WITH SALTS OF ORTHOPHOSPHORIC OR POLYPHOSPHORIC ACID

Sarwan K. Kakar, Flat Rock; Frank R. Kappler, Wyandotte, and John J. Cramer, Grosse Ile, all of Mich., assignors to The Diversey Corporation, Northbrook, Ill.

Continuation of Ser. No. 899,130, Apr. 24, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 53,824

Int. Cl.³ D06M *3/16, 5/00, 11/08*

U.S. Cl. 428—264 **11 Claims**

1. An antistatic synthetic textile material or blend of natural and synthetic textile materials impregnated with an antistatic amount of an antistatic agent consisting essentially of at least one of

(A) a neutral, ionically-bonded ammonium salt of an orthophosphoric acid,

(B) a neutral, ionically-bonded ammonium salt of a polyphosphoric acid,

(C) a neutral, ionically-bonded mixed ammonium and alkanolamine salt of orthophosphoric acid in which the alkanolamine is a 2 or 3 carbon atom alkanolamine or a mixture thereof and

(D) a neutral, ionically-bonded mixed ammonium and alkanolamine salt of polyphosphoric acid in which the alkanolamine is a 2 or 3 carbon atom alkanolamine or a mixture thereof.

4,296,166

AIR FILTER OF POLYURETHANE MESH CONTAINING CARBON ADSORBENT

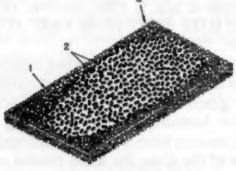
Fumiichi Ogino, Kawanishi, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 25, 1979, Ser. No. 78,717

Claims priority, application Japan, Oct. 9, 1978, 53-124411

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—283 **7 Claims**



1. Air cleaning filter element which comprises at least two sheets of three dimensional mesh-structured elastic-flexible webs prepared by selective hydrolysis of a polyurethane foam having 3 mm to 10 mm thickness as superimposed, said webs containing 9 to 31 air spaces per 25 linear millimeters, and an activated carbon adsorbent having a BET specific surface area of 500 to 2000 m^2/g and a grain size of 1 to 5 mm in diameter, said adsorbent being deposited in an amount between 200 and 2500 grams per square meter and bonded to and between the webs with an amount of adhesive agent.

4,296,167

COMPOSITIONS FOR USE IN SEAL COATS

Marcel Ceintrey, Anse de Kerjegu, 29120 Combrit, France

Continuation-in-part of Ser. No. 64,742, Aug. 8, 1979, abandoned. This application Mar. 10, 1980, Ser. No. 128,750

Claims priority, application France, Aug. 18, 1978, 78 24231

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—284 **11 Claims**

1. Seal coat for a structure comprising: (a) a binding layer deposited on said structure; and (b) a reinforcement layer comprising a non-woven material of synthetic fibres impregnated with a binder comprising a complex of a modified epoxy resin and a polyureide, which is the reaction product of a first component comprising a liquid epoxy resin and a blocked polyisocyanate prepolymer, with a second component comprising an aliphatic or cycloaliphatic polyamine, said binder covering the surface of said seal coat.

4,296,168

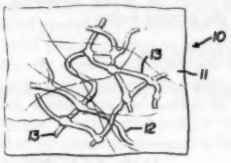
PADDING SHEET FORMED OF A MIXTURE OF FIBERS BONDED AT THEIR INTERSECTIONS

Jere B. Ambrose, 5645 Lakeshore, Holland, Mich. 48423

Filed Feb. 19, 1980, Ser. No. 122,134

Int. Cl.³ D04H *1/58*

U.S. Cl. 428—288 **1 Claim**



1. In a relatively thick, dense, non-woven fiber matted padding formed of a mixture of hair-like fibers bonded together at their intersections, the improvement comprising:

said fibers including cotton or other synthetic fibers and a minor proportion of a relatively low heat softening point thermo-plastic material which is shredded to provide fine fibers of thermo-plastic material, said fine fibers of thermo-plastic material randomly mixed within the over all mixture, said thermo-plastic fibers being formed of polypropylene, said polypropylene fibers being about 20–22 percent by weight compared with the total of the other fibers in the mixture;

said thermo-plastic material fibers each being randomly oriented within the mixture and being bonded by moving the mixture through an elongated furnace at about 450°–525° F. for heat softening the thermo-plastic material fibers to the other fibers upon which they form overlapping contact, to thereby randomly bond the fiberous mixture together without a separate bonding additive, wherein the padding is substantially free of conventional bonding resins.

4,296,169

WALLBOARD HAVING IMPROVED DRYING RATE DUE TO PLURAL CONTACTING FIBER NETWORKS

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 4, 1980, Ser. No. 118,332

Int. Cl.³ B32B *5/08, 5/12, 5/26, 13/02*

U.S. Cl. 428—298 **6 Claims**

1. A board comprising: two sheets of paper spaced apart and bonded to a core of inorganic cementitious material, said core having a network of dispersed glass monofilaments jack-strawed into a three-dimensional water transmitting network extending between its surfaces, and at least one of said layers of paper having a network of dispersed glass monofilaments jack-strawed into a water transmitting network that extends

between its major surfaces with said network in said paper being in water transmitting contact with said network of said core.

4,296,170
FIREPROOF LAMINATES

Takashi Ohashi, Iruma; Toru Okoyama, Sagamihara, and Katsuhiko Arai, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 6, 1980, Ser. No. 127,669
Claims priority, application Japan, Mar. 6, 1979, 54/26042
Int. Cl.³ B32B *5/20*
U.S. Cl. 428—313 **11 Claims**

1. A fireproof laminate comprising a urethane modified polyisocyanurate foam as a core material produced by reacting an organic polyisocyanate with a polyol in the presence of an isocyanate trimerization catalyst, a blowing agent and other additives, and a surface material piled on at least front surface of said core material, which comprises:

(1) using an aluminum foil with a thickness of not less than 0.015 mm as a front surface material for said core material, said front surface material being united with said core material by self-adhesion of said foam;

(2) using, as said polyol for the formation of said urethane modified polyisocyanurate foam, at least one low molecular weight diol (hereinafter referred to as A-group diol) selected from the group consisting of (a) compounds having the general formula

$$HO\text{-}(CH_2CH_2O)_n\text{-}H,$$

wherein n is 2, 3 or 4, (b) compounds having the general formula

$$HO\text{-}(CH_2CHO)_n\text{-}H,$$
$$\quad\quad\quad

amine groups per molecule and wherein the carboxylic acid has 1 to 5 carbon atoms;
(c) 5 to 35 percent by weight of a wax selected from the group consisting of animal waxes, vegetable waxes, mineral waxes, synthetic waxes, and petroleum waxes;
(d) about 9 percent to about 77 percent by weight of a nonionic lubricant with fatty triglycerides selected from the group consisting of hydrogenated vegetable oil;
(e) about 10 to about 45 percent by weight of an alkyl imidazoline;
(f) at least 0.01 part per part of wax and per part of nonionic lubricant of a mixture of sorbitan monostearate having an HLB of 4.7 and a polyoxyethylene (20) sorbitan monostearate having an HLB of 14.9 in a ratio to give an HLB of the mixture between about 8 and 12;
(g) about 1.5 to about 20 weight percent of gamma-methacryloxypropyltrimethoxysilane;
(h) about 0.1 to about 3 weight percent of a wetting agent; and
(i) about 0.5 to about 1 weight percent of an organotin bactericide.

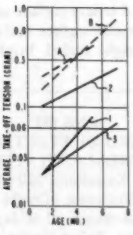
2. Glass fiber reinforced polymer tape material having glass fiber strands of claim 1.

4,296,174

SPANDEX FILAMENTS CONTAINING CERTAIN METALLIC SOAPS

Robert S. Hanzel, Wilmington, Del., and Paul J. Sauer, Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 8, 1980, Ser. No. 176,594
Int. Cl.³ D01F *6/70;* **D06M** *11/04, 13/24;* **D02G** *3/32*
U.S. Cl. 428—389 **6 Claims**



1. An improved spandex filament of the type having a lubricating finish on its surface, the improvement comprising a soap dispersed within the filament in an amount equal to at least 0.3% by weight of the filament and being a metal salt of a fatty acid, the metal being selected from the group consisting of calcium, lithium and magnesium and the fatty acid being selected from the group consisting of saturated and unsaturated fatty acids having 10 to 22 carbon atoms.

3. The filament of claim 1 wherein the concentration of the soap dispersed within the filament is in the range of 0.5 to 1.0%.

4,296,175

HOLLOW ACRYLONITRILE POLYMER FIBER

Francesco De Maria, Gulf Breeze, and Ronald E. Pfeiffer, Pensacola, both of Fla., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 13,773, Feb. 21, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 133,059
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—398 **5 Claims**

1. An acrylonitrile polymer fiber having a monolobal cross-sectional shape comprising (1) an inner hollow area extending uniformly throughout the entire fiber length and having a substantially fully opened cross-section and completely surrounding said inner hollow area, (2) an outer solid polymer area having a uniform structure, said fiber being less than about 50 denier per filament and having suitable physical properties for textile uses and said acrylonitrile polymer being a hydrophilic polymer provided by adding a pre-formed polymer selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, polyethylene oxide, polyacrylamide and polyacrylic acid to acrylonitrile and one or more monomers copolymerizable therewith in proportions which provide at least about 50 weight percent acrylonitrile and about 1 to about 10 weight percent of hydrophilic moieties in the resulting polymer.

4,296,176

INKS FOR PULSED ELECTRICAL PRINTING

Donald J. J. Lennon; John R. Hagerstrom, both of Acton, and C. Frederick W. Ekman, Bedford, all of Mass., assignors to EPP Corp., Boston, Mass.

Division of Ser. No. 710,282, Jul. 30, 1976, abandoned. This application Dec. 11, 1979, Ser. No. 102,569
Int. Cl.³ G03G *9/08*
U.S. Cl. 428—407 **3 Claims**

1. A printing ink comprising particles each having
a body of fusible resin with a colorant dispersed therein, said body being about two to ten microns in size, and
an electrically conductive coating comprising a second resin with finely divided electrically conductive particles dispersed therein, said particles being in sufficiently close mutual proximity for continuous electrical conduction therebetween within said coating, said coating being substantially entirely situated on the surface of said body, adhering thereto, said printing ink having a volume resistivity of from 10 to 10^3 ohm cm. measured at between one and two volts per cm.

4,296,177

FLEXIBLE GRAPHITE SHEET, MATERIAL OR LAYER CONTAINING METAL MOLYBDATE

Ernst Freundlinger, Meitingen-Langenreichen, and Alfred Hirschvogel, Langeweid, both of Fed. Rep. of Germany, assignors to Sigri Elektrographit GmbH, Meitingen bei Augsburg, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 106,167
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1979, 2902252
Int. Cl.³ B32B *9/00*
U.S. Cl. 428—408 **7 Claims**

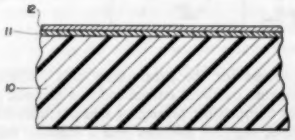
1. Flexible graphite layer material containing a metal molybdate with a solubility in water of 10^{-2} to 10^{-4} g/100 ml to inhibit corrosion.

4,296,178

ARTICLE COMPRISING A SUBSTRATE AND CHROMIUM ALLOY COATING

Neal M. Griesenauer, Grove City, and Julius J. Gersi, Worthington, both of Ohio, assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 18, 1979, Ser. No. 40,356
Int. Cl.³ C23C *15/00*
U.S. Cl. 428—462 **10 Claims**



1. An article comprising a substrate and a thin film metal

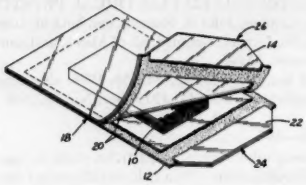
alloy coating formed on a surface of said substrate by a process of depositing small particles on said substrate, said metal alloy consisting of 78–97.5% by weight of chromium, at least two elements selected from the group consisting of molybdenum, nickel and cobalt in the combined proportion of 2–20% by weight, and 0.5–2% by weight of a scavenger element.

4,296,179

FRANGIBLE BONDING USING BLUSH LACQUER

Charles R. Wardwell, 559 Oak St., Winnetka, Ill. 60093

Division of Ser. No. 482,436, Jun. 24, 1974, Pat. No. 3,938,659.
This application Oct. 24, 1975, Ser. No. 625,506
Int. Cl.³ B32B *9/06*; C09J *7/02*; A61B *17/06*
U.S. Cl. 428—498 **3 Claims**



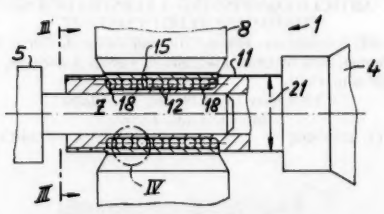
1. A product with frangible bonding including the combination of a paper substrate having internal bonds bonding it together internally, and a frangible bonding system, said frangible bonding system comprising a bonding agent in the form of a dried blush lacquer bonded to said substrate by interlayer bonds, and heat seal material for bonding said blush lacquer to a surface, said heat seal material having internal bonds bonding it together internally and being bonded to said blush lacquer by interlayer bonds, said dried blush lacquer being formed of film-forming resin containing voids, the film-forming resin forming cohesive internal bonds of said blush lacquer, said voids making said cohesive internal bonds of said blush lacquer weaker than the internal bonds of said substrate and said heat seal material and the interlayer bonds between said blush lacquer and said substrate and between said blush lacquer and said heat seal material.

4,296,180

PROCESS FOR THE PRODUCTION OF METALLIC FORMED MEMBERS

Siegfried Rhau, Nuremberg, and Adolf Weber, Neunkirchen, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,545
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852657
Int. Cl.³ B21B *00/00*; F42B *13/48*
U.S. Cl. 428—558 **14 Claims**



1. In a process for the production of a formed member, including discrete particles embedded in a metallic matrix, the improvement comprising: arranging said particles intermediate a metallic basic support member and a metallic outer casing; embedding said particles in said basic support member and said outer casing through round cold forging of said outer casing, and having forging wedges which extend along and over all of said particles concurrently work over the full length of said outer casing in conformance with the length of the particle arrangement along the axial direction of said formed member during rotation of said formed member.

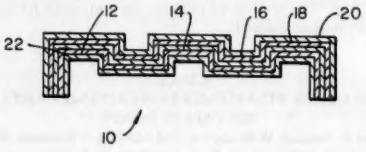
2. A formed member comprising discrete particles embedded in a metallic matrix including a metallic basic support member and a metallic outer casing, with said particles being embedded in said basic support member and in said outer casing.

4,296,181

PLATING METHOD AND STRUCTURE

Samuel A. Nehra, 12 Lake Shore La., Grosse Pointe Shores, Mich. 48236

Filed Jan. 16, 1980, Ser. No. 112,468
Int. Cl.³ C23C *7/00*
U.S. Cl. 428—626 **4 Claims**



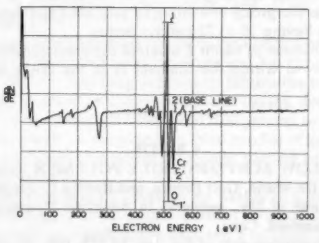
1. A plated article having a reactive surface constructed of one of plastic, resin, aluminum, steel and zinc, comprising a cleaned article surface, a flame sprayed tin zinc metal coating which is over 50% tin by weight and four or more mils thick adhering to the cleaned article surface and chrome metal plating over the sprayed metal surface including copper cyanide, bright copper, semi-bright nickel, bright nickel and chrome layers.

4,296,182

CAN COMPOSED OF ELECTROLYTICALLY CHROMATED STEEL

Hiroshi Matsubayashi, Kamakura; Michiko Tsurumaru, Tokyo; Makoto Horiguchi, Fujisawa; Hiroshi Ueno, Yokosuka, and Yoichi Kitamura, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed May 1, 1979, Ser. No. 35,333
Claims priority, application Japan, May 8, 1978, 53-53819; Dec. 13, 1978, 53-153202
Int. Cl.³ B65D *7/00*; C25D *11/38*; C23C *17/00*; B32B *15/08*
U.S. Cl. 428—629 **4 Claims**



1. A can at least a part of which is made of an electrolytically chromated steel sheet having a chromium-containing surface layer consisting of a layer of metallic chromium and a layer of chromium oxide, the thickness of the metallic chromium layer being from 20 to 300 mg/m² and the thickness of the chromium oxide layer being 5 to 50 mg/m² based on the amount of chro-

mium, said steel sheet having a surface such that when it is degreased in acetone for 1 minute and analyzed by an Auger electron spectrometer at an incident electron accelerating voltage of 3 KeV, a modulation voltage of 3 V, a modulation frequency of 12 to 20 KHz and a degree of vacuum of at least 6×10^{-8} torr, the ratio of the peak-peak distance ($O_{P\text{-}P}$) of $KL_{2,3}L_{2,3}$ of oxygen to the base-peak distance ($Cr_{B\text{-}P}$) of $L_3M_{2,3}M_{4,5}$ of chromium in the resulting Auger electron spectrum satisfies the following relation:

$6.5 \geqq (O_{P\text{-}P})/(Cr_{B\text{-}P}) \geqq 1.5$.

4,296,183

AL-SN BASE BEARING ALLOY AND COMPOSITE

Keiiti Iwahana; Yoshimi Mathuda, and Kenichiro Futamura, all of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed Apr. 2, 1980, Ser. No. 136,638
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—653 **6 Claims**

1. An Al-Sn base bearing alloy consisting essentially of 3.5 to 25 wt.% of Sn; 0.1 to 1.0 wt.% of Cr; 0.5 to 9 wt.% in total of one or more members selected from the group consisting of Pb, Bi, In and Cd; and the remainder is Al.

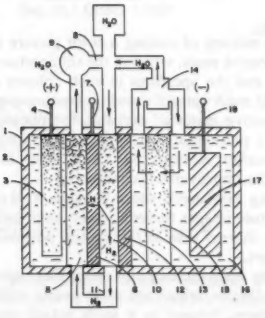
3. A bearing material which is made by applying said bearing alloy as claimed in claim 1 to a backing steel sheet by pressure welding.

4,296,184

ELECTROCHEMICAL CELL

John Z. O. Stachurski, 220 Kaymar Dr., Amherst, N.Y. 14150

Filed Jan. 3, 1980, Ser. No. 109,241
Int. Cl.³ H01M *12/04*
U.S. Cl. 429—14 **3 Claims**



1. A method of operating an electrochemical cell as a galvanic cell or as an electrolytic cell, said cell comprising

a housing, a semipermeable membrane dividing the housing into two chambers, first and second, said first chamber containing protogenous ion-conducting liquid and a positive electrode, said second compartment containing an aprotic, ion-conducting liquid and also containing a negative electrode which corrodes when exposed to the protogenous liquid, said protogenous liquid being partly soluble in the aprotic liquid;

said method preventing the corrosive protogenous liquid from reaching said negative electrode, comprising the steps of

subdividing the second chamber by means of a porous partition into two compartments, one adjacent to said membrane, and the other containing the negative electrode;

flowing the aprotic liquid, free of the protogenous liquid, into the compartment containing the negative electrode;

flowing the aprotic liquid across the porous partition away from the negative electrode to prevent the protogenous liquid present in the aprotic liquid from reaching the negative electrode;

flowing said aprotic liquid from the porous partition and between it and the semipermeable membrane and into the drying means, in order to remove the protogenous substance which gets into the aprotic liquid while it is in contact with the semipermeable membrane,

flowing aprotic liquid back to the negative electrode compartment.

4,296,185

COATING FOR LITHIUM ANODE, THIONYL CHLORIDE ACTIVE CATHODE ELECTROCHEMICAL CELL

Vincent O. Catanzarite, 7044 Mira Vista, Las Vegas, Nev. 89120

Continuation-in-part of Ser. No. 53,988, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 840,521, Oct. 11, 1977, Pat. No. 4,170,693. This application Apr. 25, 1980, Ser. No. 143,719
The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.
Int. Cl.³ H01M *6/14*
U.S. Cl. 429—48 **16 Claims**

1. An electrochemical cell comprising:

(a) a cathode current collector;

(b) an anode mechanically spaced from said cathode current collector;

(c) an ionically conductive electrolyte in physical contact with said anode and cathode current collector, said electrolyte consisting of a solute dissolved in a solvent that also performs the function of an active cathode depolarizer;

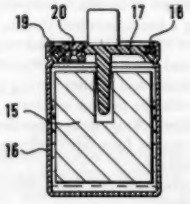
(d) a coating contiguous to said anode, said coating consisting of a compound in the cyanoacrylate family.

4,296,186

TWO PART PRESSURE RELIEF VALVE

Franz J. Wolf, Bad Soden-Salmunster, Fed. Rep. of Germany

Continuation of Ser. No. 715,463, Aug. 18, 1976, abandoned. This application Jul. 13, 1979, Ser. No. 57,358
Int. Cl.³ B65D *51/16*; F16K *15/14*; H01M *2/12*
U.S. Cl. 429—54 **7 Claims**



1. In combination, a sealing lid of plastic, a container subject to super-atmospheric internal pressure such as a capacitor or battery, said lid having a peripheral groove with elastomeric sealing material therein engaged by the container, said lid having a transverse opening therethrough, and a pressure relief valve molded directly in said opening comprising:

(a) a one piece valve housing of the same material as said sealing material, with the inner surface of the opening fitting firmly around the housing, the valve housing having an axial length substantially equal to the axial length of the opening, means defining a chamber in said housing including an annular valve seat, an axially opening conically upwardly flaring inlet communicating with said valve seat, an axially oriented outlet communicating with said chamber remote from said valve seat, and being eccentric relative to the axis of said valve seat, said chamber defining means comprising means defining a chamber surface conically outwardly flaring from said valve seat

and means defining wall means being formed in one piece with said means defining said flaring chamber surface and generally parallel to the plane of said valve seat and spaced therefrom,

(b) a spherical valve body in said valve chamber engaging an imperforate portion of said wall means and being partially embedded in said wall means, and engaging said valve seat when said valve is closed,

(c) said wall means being elastically strained when said valve is closed and forcing said valve body against said valve seat, and

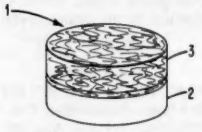
(d) means for preventing axial shifting of said valve housing relative to said lid comprising an inwardly directed collar intermediate the ends of said opening engaging an annular recess in the housing, the surface of the opening and collar fitting firmly around the housing.

4,296,187

INTEGRATED CARBON/INSULATOR STRUCTURE AND METHOD FOR FABRICATING SAME

John E. Barnes, Wakefield; Franz Goebel, Sudbury, and William T. McHugh, Westwood, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 13, 1980, Ser. No. 159,266
Int. Cl.³ H01M 6/14
U.S. Cl. 429—105 **11 Claims**



1. An integrated carbon/insulator structure for an electrochemical cell, comprising:

a porous substrate of an electrically-nonconductive material and having a predetermined thickness; and

a porous layer of a carbon material supported by the porous substrate, said layer of carbon material having a predetermined thickness and further having a portion thereof at its interface with the porous substrate permanently diffused into and interlocking with a portion of the porous substrate thereby to form an integrated structure with the porous substrate.

7. An electrochemical cell comprising:

a metal housing;

an electrochemical system within the metal housing and including an electrolytic solution and a battery stack exposed to said electrolytic solution, said battery stack comprising:

an anode; and

an integrated carbon/insulator structure adjacent to the anode, said integrated carbon/insulator structure comprising:

a porous substrate of an electrically-non-conductive material adjacent to the anode and having a predetermined thickness; and

a porous layer of a carbon material supported by the porous substrate, said layer of carbon material having a predetermined thickness and further having a portion thereof at its interface with the porous substrate permanently diffused into and interlocking with a portion of the porous substrate thereby to form an integrated structure with the porous substrate.

4,296,188

CD(SE,TE) ALLOY PHOTOVOLTAIC MATERIALS

Gary Hodes; David Cahen, and Joost Manassen, all of Rehovot, Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Mar. 27, 1980, Ser. No. 134,665
Claims priority, application Israel, Jul. 7, 1979, 57908
Int. Cl.³ H01M 6/36
U.S. Cl. 429—111 **8 Claims**

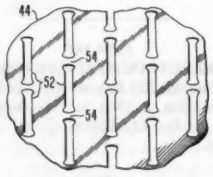
2. A photoelectrochemical cell comprising a photoelectrode, an electrolyte, and a counterelectrode, said photoelectrode comprising a Cd(Se,Te) alloy comprising about 30 mole % to about 90% mole % CdSe and wherein said electrolyte comprises a $S/S^{=}$ redox couple.

4,296,189

COLOR PICTURE TUBE HAVING IMPROVED SLIT TYPE SHADOW MASK AND METHOD OF MAKING SAME

Henry W. Kuzminski, Ephrata, Pa., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 41,998, May 24, 1979. This application Nov. 17, 1980, Ser. No. 207,781
Int. Cl.³ G03C 5/00
U.S. Cl. 430—5 **2 Claims**



1. In a method of making a color picture tube having a slit type apertured mask, wherein the slit apertures are arranged in columns and the apertures in each column are separated by webs, said mask being formed by coating a metal sheet with a photosensitive material, exposing the photosensitive material through a photomaster having an apertured pattern thereon and thereafter etching the metal sheet to form apertures therein, the improvement comprising

exposing said metal sheet through a photomaster having aperture images thereon which have greater width at the ends thereof than at the central portions of the aperture images,

whereby upon etching said metal sheet apertures are generated therein which are more nearly rectangular than are apertures formed in a mask which was exposed by a photomaster having rectangular aperture images.

4,296,190

PHOTOSENSITIVE MATERIAL FOR USE IN ELECTROPHOTOGRAPHY WITH A RADIATION CURED BINDER RESIN

Haruo Hasegawa; Hiroyoshi Taniguchi, and Takao Igawa, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 809,795, Jun. 24, 1977, abandoned, which is a continuation of Ser. No. 627,544, Oct. 31, 1975, abandoned. This application Jun. 11, 1979, Ser. No. 47,229
Int. Cl.³ G03G 5/04
U.S. Cl. 430—57 **14 Claims**

1. An electrophotographic plate, comprising:

an electrically conductive substrate;

a first photoconductive layer coated over said substrate and having a thickness of from 0.1μ to 10μ, said first photoconductive layer consisting essentially of a mixture of an inorganic or organic first photoconductor and a resin that has been cured by ionizing radiation, said first photocon-

ductive layer having been prepared by applying onto said substrate a liquid dispersion or solution of said first photoconductor and from 0.2 to 50 percent by weight, based on the weight of said first photoconductor, of a radiation-curable resin selected from the group consisting of non-modified maleic anhydride-type unsaturated polyester, silicone-modified, urethane-modified or acrylic urethane-modified maleic anhydride-type unsaturated polyester, polyester having maleyl group therein, acrylic polymer having maleyl group therein, epoxide resin having maleyl group therein, acrylic polymer having acryloyl group as a side chain thereof, telomerized polyester acrylate, telomerized polyamide acrylate, epoxyacrylate, urethane acrylate, silicone acrylate, and reactive allyl group-containing resin, and then applying ionizing radiation to said first photoconductive layer, in a solvent-free state, until said radiation-curable resin has been cured; and

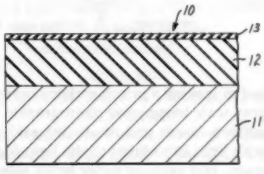
a second photoconductive layer coated over said first photoconductive layer and having a thickness of from 3μ to 50μ, said second photoconductive layer consisting essentially of an organic second photoconductor and a resin binder therefor, said second photoconductive layer having been prepared by applying a liquid dispersion or solution of said organic second photoconductor and said resin binder in an organic solvent onto said first photoconductive layer having said cured resin therein and then evaporating the solvent.

4,296,191

TWO-LAYERED PHOTORECEPTOR CONTAINING A SELENIUM-TELLURIUM LAYER AND AN ARSENIC-SELENIUM OVER LAYER

Richard L. Jacobson, Roseville, and Timothy T. Lin, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 16, 1980, Ser. No. 159,878
Int. Cl.³ G03G *5/082*
U.S. Cl. 430—57 **14 Claims**



1. A composite photoreceptor member including a support layer and only two layers of photoconductive materials, said two layers including:

a. a first layer of a vitreous selenium and tellurium composition carried on the support layer,

b. and a second layer comprising vitreous arsenic-selenium composition overlaying said layer of vitreous selenium-tellurium composition wherein said layer of selenium-tellurium composition is about 40 to 80 microns in thickness and said layer of arsenic-selenium composition is about 0.5 to 5.0 microns in thickness.

4,296,192

ELECTROSTATOGRAPHIC TONER COMPOSITION

Robert J. Gruber, Pittsford; Steven B. Bolte, Webster; John F. Knapp, Fairport; Dale R. Ims, Webster, and Richard B. Lewis, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1979, Ser. No. 54,203
Int. Cl.³ G03G *9/00*
U.S. Cl. 430—109 **6 Claims**

1. An improved electrostatographic toner composition comprised of a resin, and a colorant, the resin consisting essentially of a polyether polymer resulting from the reaction product of 50 mol percent of a dihydric phenol, containing about 10 to 25 mol percent of a polyalkylene ether glycol selected from the group consisting of diethylene glycol, triethylene glycol, tetraethylene glycol, di-1,2-polylene glycol, tri-1,2-propylene glycol, and tetra 1,2-propylene glycol, and about 40 mol percent to about 25 mol percent of epichlorohydrin.

4,296,193

PHOTOSENSITIVE POSITIVE DIAZO MATERIAL WITH COPOLYMER OF ACRYLAMIDE AND DIACETONEACRYLAMIDE AND A PROCESS FOR DEVELOPING TO FORM COLOR RELIEF IMAGE

Takeo Moriya, Kawagoe, and Toshio Yamagata, Urawa, both of Japan, assignors to Kimoto & Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1980, Ser. No. 161,513
Claims priority, application Japan, Jan. 16, 1980, 55-3407
Int. Cl.³ G03C *1/60, 1/71, 1/74, 5/34*
U.S. Cl. 430—149 **7 Claims**

1. A photosensitive material comprising a base material and a layer of a positive image forming, alkali developable photosensitive composition wherein, after exposure to light, the light exposed areas are removable by washing, and said layer is formed on said base material, said photosensitive composition comprising (A), 100 parts by weight of a water soluble resin binder containing at least 60 weight % of acrylamide-diacetoneacrylamide copolymer, the copolymerization of acrylamide to diacetoneacrylamide being 8:2–5:5 and the average polymerization degree being 300–1500, and (B), 5–20 parts by weight of a water-soluble, photosensitive diazonium salt.

4. A process for forming a color-developed positive relief image comprising: forming on a base material, a layer of a positive-image forming, alkali developable photosensitive composition comprising (A), 100 parts by weight of a water soluble resin binder containing at least 60 weight % of acrylamidediacetoneacrylamide copolymer, the polymerization ratio of acrylamide and diacetoneacrylamide being 8:2–5:5 and average polymerization degree being 300–1500, and (B), 5–20 parts by weight of a water-soluble, photosensitive diazonium salt;

exposing said photosensitive material to form an image thereon; and

developing said exposed photosensitive material by contact with an alkali developer.

4,296,194

POSITIVE-WORKING LIGHT SENSITIVE DIAZO MATERIALS WITH AZO DYE

Terence Harper, Leeds, and Allen P. Gates, Knaresborough, both of Great Britain, assignors to Vickers Limited, London, England

Continuation of Ser. No. 895,070, Apr. 10, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,190
Claims priority, application United Kingdom, Apr. 12, 1977, 15144/77
Int. Cl.³ G03C *1/60, 1/54*
U.S. Cl. 430—176 **10 Claims**

1. A positive working light-sensitive composition which exhibits a colour change upon exposure to light, which composition comprises in admixture (a) a first component which is an azo dye formed by reacting a p-aminobenzene diazonium salt and a compound selected from 3-hydroxy-2-naphthoic acid and acid derivatives thereof and (b) a second component which includes a non-light sensitive polymer and and o-quinone diazide and/or a diazonium compound and which, on exposure to light, produces an acidic light decomposition product which is capable of reacting with the azo dye to produce a material having a colour different to that of the azo dye.

4,296,195
TWO-SHEET DIFFUSION TRANSFER ASSEMBLAGES AND PHOTOGRAPHIC ELEMENTS

John F. Bishop, and Wayne A. Bowman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1980, Ser. No. 174,420
Int. Cl.³ G03L *5/54, 7/00, 1/76*
U.S. Cl. 430—215 **23 Claims**

1. In a photographic element comprising a support having thereon, in order, a polymeric acid layer, a timing layer and at least one unexposed photosensitive silver halide emulsion layer having associated therewith a dye image-providing material,

the improvement wherein a primer layer is located between said polymeric acid layer and said timing layer, said primer layer comprising:

(a) a mixture of gelatin and cellulose nitrate; or

(b) a mixture of an acrylic acid copolymer and an acrylic acid terpolymer, said acrylic acid copolymer comprising 60 to 90 weight percent of recurring units derived from acrylic acid and 10 to 40 weight percent of recurring units derived from an alkyl acrylate or alkyl methacrylate, wherein said alkyl group has 1 to about 10 carbon atoms, said acrylic acid terpolymer comprising 5 to 40 weight percent of recurring units derived from acrylic acid, 10 to 40 weight percent of recurring units derived from acrylonitrile and 20 to 85 weight percent of recurring units derived from vinylidene chloride, said acrylic acid copolymer comprising from about 40 to about 90 weight percent of said mixture; or

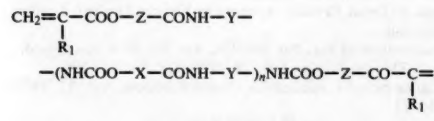
(c) an acrylic acid copolymer comprising 5 to 30 weight percent of recurring units derived from acrylic acid and 70 to 95 weight percent of recurring units derived from an alkyl acrylate or alkyl methacrylate, wherein said alkyl group has 1 to about 10 carbon atoms.

4,296,196
PHOTOPOLYMERIZABLE MIXTURE IN A TRANSFER ELEMENT

Raimund J. Faust, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

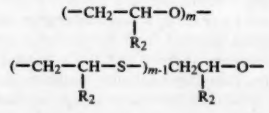
Division of Ser. No. 41,741, May 23, 1979, Pat. No. 4,250,248. This application Jun. 27, 1980, Ser. No. 163,597
Int. Cl.³ G03C *5/00, 1/68*
U.S. Cl. 430—271 **12 Claims**

1. A light-sensitive transfer material, comprising a flexible temporary support and a thermoplastic photopolymerizable layer which layer comprises a polymeric, thermoplastic binder which is soluble or at least swellable in aqueous-alkaline solutions, a polyurethane with two terminal acrylic acid or methacrylic acid ester groups which is capable of addition polymerization, and a photoinitiator, said polyurethane corresponding to Formula I



wherein

—X— is one of the groups

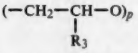


—C_kH_{2k}—O— and

—C_rH_{2r-2}—O—

Y is a saturated aliphatic or cycloaliphatic group with 2 to 12 carbon atoms, and

Z is



and wherein

R_1, R_2, and R_3 are hydrogen atoms or methyl groups,

n is a whole number from 2 to 15,

m is a whole number from 2 to 4,

p is a whole number from 1 to 4,

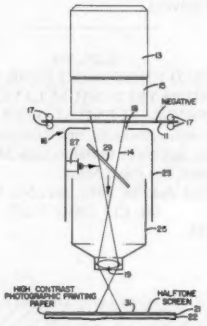
k is a whole number from 2 to 12, and

r is a whole number from 4 to 12.

4,296,197
HALFTONE PRINTING SYSTEM

Robert W. Stevie, Ft. Thomas, Ky., assignor to Innovative Photographic Enterprises, Inc., Cincinnati, Ohio

Continuation of Ser. No. 803,256, Jun. 3, 1977, abandoned. This application Nov. 1, 1979, Ser. No. 90,475
Int. Cl.³ G03F *5/00;* **G03C** *5/00*
U.S. Cl. 430—300 **5 Claims**



1. A method of making a printing plate comprising focusing light into a gray scale image onto photographic printing paper through a halftone screen and irradiating said paper through said screen with light in addition to the light focused into said gray scale image, said printing paper being selected to have a sufficiently high contrast rating to produce dots which are uniformly black with no shades of gray over the area of each dot in the resulting halftone image produced on said printing paper, assembling said halftone print with cold type to make up a page, making a negative of the assembly of said cold type and said halftone print, and making a printing plate from said negative.

4,296,198
PHOTOGRAPHIC PROCESS USING A THIN FLEXUOUS LAYER AND REFLECTIVE LAYER

Franz Trautweiler, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Jul. 2, 1979, Ser. No. 54,044
Claims priority, application Switzerland, Jul. 7, 1978, 7421/78
Int. Cl.³ G03C *1/84, 11/14*
U.S. Cl. 430—403 **18 Claims**

1. In a process for the production of a photographic print including the steps of providing a composite photographic material comprising a transparent support layer carrying photosensitive material, forming the print image including at least the steps of exposing the photosensitive material and developing the exposed photosensitive material, and then adhering the image-bearing composite material to a main support with the

developed photosensitive material disposed between said support layer and said main support, the improvement comprising providing said support layer as a flexuous layer having a thick-

ness of from about 5μ to 50μ and having a light reflective layer adhered to said main support with said developed photosensitive layer being in contact with said light reflective layer.

4,296,199

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Morio Yagihara, and Yukio Yokota, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 19, 1980, Ser. No. 161,237
Claims priority, application Japan, Jun. 19, 1979, 54-77152
Int. Cl.³ G03C *1/40*
U.S. Cl. 430—551 **22 Claims**

1. A silver halide photographic light-sensitive material containing a colorless photographic cyan color-forming coupler having, in a position for coupling with an oxidation product of an aromatic primary amine developing agent, a coupling-off group represented by the formula (I)

$$—O—(R_1S)_x(R_2S)_yR_3 \quad (I)$$

wherein R_1 and R_2 each represents an unsubstituted straight or branched chain alkylene group; R_3 represents a substituted or unsubstituted alkyl group, a cycloalkyl group, an aryl group, or a heterocyclic group; x represents a positive integer; and y represents 0 or a positive integer.

16. A light-sensitive material as in claim 1, wherein said coupler is present in a layer containing a p-substituted phenol derivative or in a layer adjacent to a layer containing a p-substituted phenol derivative.

4,296,200

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Morio Yagihara, and Yukio Yokota, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 12, 1980, Ser. No. 177,337
Claims priority, application Japan, Aug. 13, 1979, 54-102963
Int. Cl.³ G03C *1/40*
U.S. Cl. 430—551 **18 Claims**

1. A silver halide photographic light-sensitive material containing a colorless photographic cyan color forming coupler having, in a position for coupling with an oxidation product of an aromatic primary amine developing agent, a coupling-off group represented by the formula (I):

$$—O—R—S—R_1 \quad (I)$$

wherein R represents a substituted alkylene group containing from 1 to 18 carbon atoms or an unsubstituted or substituted alkenylene group, and said alkylene group or alkenylene group may be straight or branched chain; and R_1 represents a substituted or unsubstituted alkyl group, an alkenyl group, an aralkyl group, an aralkenyl group, a cycloalkyl group, or a heterocyclic group and said alkyl group, alkenyl group, aralkyl group and aralkenyl group may be straight chain or branched chain; and said heterocyclic group being connected with a thio group at the position of a carbon atom of the heterocyclic group.

15. A light-sensitive material as in claim 1, wherein said coupler is present in a layer adjacent to a layer containing a p-substituted phenol derivative or in a layer containing a p-substituted phenol derivative.

4,296,201

METHODS FOR THE DETECTION OF ANTIMITOCHONDRIAL AND ANTINUCLEAR ANTIBODIES

Wolfgang Ax, Marburg an der Lahn; Hartwig W. Bauer, Munich, and Hans-Harald Sedlacek, Marburgh an der Lahn, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,003
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1978, 2836362
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 **2 Claims**

1. A method for testing for the presence of anti-mitochondrial antibodies which comprises coating air-dried unfixed hypernephroma cells with an isotonic salt solution of the antibody to be tested, incubating the coated cells for 10 minutes to 2 hours in a moist chamber, then washing the cells with an isotonic salt solution and coating them with a fluorescently-labeled antibody directed against antigen-determinants of the antibody sought for, incubating the cells for 10 minutes to 2 hours in a moist chamber, washing at least once with demineralized water, and examining the cells by immunofluorescence microscopy, whereby fluorescence of the mitochondria of the hypernephroma cells is considered a positive finding of said anti-mitochondrial antibodies.

4,296,202

DIAGNOSTIC COMPOSITION FOR THE DETECTION OF LEUKOCYTES AND CHROMOGENS USEFUL THEREIN

Dieter Berger, Viernheim; Franz Braun, Rimbach; Günter Frey, Ludwigshafen; Werner Güthlein, Mannheim-Neckarau, and Manfred Kuhr, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Fed. Rep. of Germany

Filed Aug. 2, 1979, Ser. No. 63,211
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836644
Int. Cl.³ C12Q *1/29*
U.S. Cl. 435—29 **36 Claims**

1. Diagnostic composition for the detection of leukocytes in body fluids, comprising an absorbent carrier impregnated with a buffer substance and a chromogen, wherein the chromogen is an azo dyestuff ester of the formula

$$A—N{=}N—B(OR)_n$$

wherein

A is a five- or six-membered heterocyclic radical of up to 2 hetero ring atoms selected from nitrogen, sulfur and oxygen, and wherein the heterocyclic ring may be substituted with at least one member of the group selected from halogen, lower alkyl and lower alkoxy; or

A is phenyl substituted by at least one member of the group selected from lower alkyl, lower alkoxy, nitro, sulphanato and acylamino;

B is benzene, naphthalene or quinoline, optionally substituted with one or two radicals selected from sulphanato, lower alkoxy and lower alkoxypoly-alkyleneoxy;

R is a carboxylic acid residue or an amino acid or peptide residue having a nitrogen protective group; and

n is 1 or 2.

4,296,203
XANTHOMONAS BIPOLYMER FOR USE IN DISPLACEMENT OF OIL FROM PARTIALLY DEPLETED RESERVOIRS

William C. Wernau, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 15, 1977, Ser. No. 851,757
Int. Cl.[3] C12P *19/06;* C12N *15/00, 1/20;* C12R *1/64*
U.S. Cl. 435—104 9 Claims

1. A process for preparing a pyruvate-free xanthan-containing fermentation broth suitable for the preparation of mobility control solutions used in oil recovery which comprises aerobically fermenting a pyruvate-free xanthan producing strain of *Xanthomonas campestris* in an aqueous nutrient medium whose ingredients comprise a carbohydrate, a source of assimilable nitrogen and trace elements and continuing the fermentation until at least about 100 ppm of pyruvate-free xanthan is present in the broth.

7. A process for preparing deacetylated pyruvate-free xanthan suitable for use in the recovery of oil from an oil-bearing subterranean formation by injecting a mobility control solution containing said deacetylated pyruvate-free xanthan into said formation which comprises

(a) fermenting by aerobic propagation a pyruvate-free xanthan producing strain of *Xanthomonas campestris* in an aqueous nutrient medium whose ingredients comprise a carbohydrate, a source of assimilable nitrogen and trace elements until at least about 100 ppm of pyruvate-free xanthan is present in the broth,

(b) adjusting the pH of the whole or filtered broth to about 9, allowing the resultant broth to stand at room temperature for at least 10 minutes and optionally neutralizing, and

(c) adding sufficient water miscible precipitating agent to cause precipitation of said deacetylated pyruvate-free xanthan and separating said precipitated deacetylated pyruvate-free xanthan therefrom.

9. A biologically pure culture of the microorganism *Xanthomonas campestris,* having the identifying characteristics of ATCC 31313, said culture being capable of producing pyruvate-free xanthan in a recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances.

4,296,204
USE OF MOTIONLESS MIXER AS CELL CULTURE PROPAGATOR

Roy Grabner, Blue Bell, Pa., and Edward L. Paul, Chatham Township, Union County, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 872,289, Jan. 25, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,641
Int. Cl.[3] C12M *7/00*
U.S. Cl. 435—235 2 Claims

1. A process for propagating cells comprising attaching cells to the surfaces of a motionless mixer element disposed within a housing, the motionless mixer element comprising an assembly of parallel sheets shaped to provide a plurality of channels which converge and diverge to form a plurality of mixing cells, each cell being formed and bounded by the juncture of two inlet channels which converge toward each other at about right angles in one plane, and two outlet channels which diverge from each other at about right angles in another plane, the planes being rotated about 90° with respect to each other, supplying nutrients into the mixer and

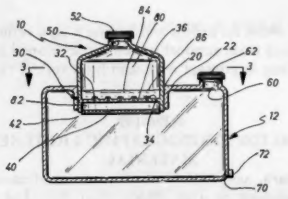
maintaining the cells under conditions which permit cell growth and division,

and harvesting the cells.

4,296,205
CELL CULTURE AND CONTINUOUS DIALYSIS FLASK AND METHOD

Dharmvir S. Verma, 5831 Rutherglen, Houston, Tex. 77096

Filed Feb. 22, 1980, Ser. No. 123,552
Int. Cl.[3] C12M *3/04;* C12N *5/00*
U.S. Cl. 435—240 12 Claims



1. In a flask for the growth of cells or the preparation of conditioned media comprising a tissue culture chamber, a dialysis chamber and a dialysis or millipore membrane separating said chambers, the improvement comprising a tissue culture shelf separating the tissue culture chamber into a tissue culture compartment and a dialysis compartment, said shelf having one or more perforations, wherein the edges of said tissue culture shelf surrounding said perforations are upraised to form tray-like areas so that cells cultured on said shelf do not pass over said edges and through said perforations.

4,296,206
IRREVERSIBLE ANTI-GLUCOCORTICOIDS

S. Stoney Simons, Jr., Bethesda, Md., assignor to United States of America, Washington, D.C.

Filed Apr. 30, 1980, Ser. No. 145,350
Int. Cl.[3] C12N *5/00*
U.S. Cl. 435—240 5 Claims

1. In a method for inhibiting glucocorticoid action, the improvement which comprises the use as the inhibitor of a compound selected from the group consisting of cortisol-21-mesylate and dexamethasone-21-mesylate.

4,296,207
ANTIFREEZE PROTECTION OF ROADS

Werner Siegmund, Mannheim, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 5, 1980, Ser. No. 156,747
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1979, 2923939; Oct. 24, 1979, 2943447; Nov. 16, 1979, 2946823
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—53 15 Claims

1. An admixture for the surface layer of a road, comprising:

a first and primary component thereof, being a granular, inorganic material, grains thereof being porous, in which the pore volume is at least 30 degrees, the pores containing a first antifreeze substance;

a second and secondary component, being a granular, organic materal, the grains thereof also being porous and having a pore volume in excess of 30 degrees, the pores containing a second antifreeze substance;

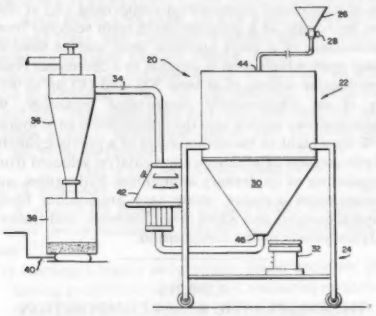
at least one of the components being made hydrophobic through the addition of a silicon-organic compound; and

the grains of said first and second component being embedded in a bituminous, or asphalt, binder.

4,296,208
METHODS OF PREPARING POLYIMIDES AND POLYIMIDE PRECURSORS

John Gagliani, and Usman A. K. Sorathia, both of San Diego, Calif., assignors to International Harvester Company, Chicago, Ill.

Filed Sep. 12, 1980, Ser. No. 186,670
Int. Cl.[3] C08J 9/00; C08G 18/16
U.S. Cl. 521—77 18 Claims



1. A method of preparing a dry, foamable, particulate precursor which can be converted into a polyimide by heating it, said method comprising the steps of: forming a primary diamine, 3,3',4,4'-benzophenonetetracarboxylic acid ester solution by dissolving one or more such diamines and the aforesaid acid or an anhydride thereof in a lower alkyl alcohol, atomizing said solution, and drying the droplets obtained by atomizing the diamine, ester solution with a heated gas.

4,296,209
MATERIAL AS SPONGIOSACEMENT WITH EFFERVESCENT REABSORPTIVE EFFECT

Dobrivoje Tomic, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 961,346, Nov. 17, 1978, abandoned. This application Mar. 26, 1980, Ser. No. 133,973
Int. Cl.[3] C08K 3/10, 3/24, 5/11; C08L 33/12
U.S. Cl. 521—85 2 Claims

1. A cement mixture for use in surgical and therapeutic procedures in animals, comprising

(a) approximately 70% by weight polymethylmethacrylate as a cementitious substance,

(b) approximately 20% $CaCO_3$ as effervescent medium,

(c) approximately 10% $Na_2HPO_4.12H_2O$ as reabsorptive substance, and,

(d) phosphoric acid as an agent for activating said medium to cause said medium to effervesce whereby when said cement is mixed and applied to an animal bone, solid tissue and the like the effervescent effect and reabsorptive substance will produce voids in said cement prior to the curing of said cement in situ.

4,296,210
OPEN-CELL SHAPED ARTICLE MADE OF ACETALIZED POLYVINYL ALCOHOL AND PROCESS FOR ITS MANUFACTURE

Wolfgang Zimmermann, Kelkheim; Hermann Schindler, Hofheim am Taunus, and Günther Pospich, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 26, 1980, Ser. No. 211,332
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948508
Int. Cl.[3] C08V 9/30
U.S. Cl. 521—85 9 Claims

1. An open-cell shaped article made of acetalized polyvinyl alcohol which is characterized in that the shaped article (a) consists of acetalized polyvinyl alcohol which, prior to acetalization, has an ester number of 50 to 270 mg of KOH/g and the 4% by weight aqueous solution of which has a viscosity of 4 to 50 mPa·s at 20° C., (b) has cells with diameters in the range of from 0.5 to 5 mm in uniform distribution and (c) contains a nucleic acid.

4,296,211
PROCESS FOR THE PRODUCTION OF POLY (POLYISOCYANATE-POLYOL-ALKALI METAL SILICATE) SOLID OR FOAMED PRODUCTS

David H. Blount, 5450 Lea St., San Deigo, Calif. 92105

Division of Ser. No. 146,474, May 5, 1980, which is a continuation-in-part of Ser. No. 36,350, May 7, 1979, which is a continuation-in-part of Ser. No. 889,932, Mar. 27, 1978, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,072,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Jan. 26, 1981, Ser. No. 228,083
Int. Cl.[3] C08G 77/00
U.S. Cl. 521—154 26 Claims

1. The improved process for the production of poly(-polyisocyanate-polyol-alkali metal silicate) foamed products by mixing and reacting the following components:

(a) the improvement comprises of producing an emulsion of a polyol and alkali metal silicate, which contains only water molecules that are attached to the alkali metal silicate,

(b) an organic polyisocyanate or polyisothiocyanate.

4,296,212
ELASTOMERIC POLYURETHANE-POLYUREA POLYMER PREPARED FROM AN ORGANIC POLYISOCYANATE A POLYOL AND AN AROMATIC DIAMINE HAVING AT LEAST ONE OF THE ORTHO POSITIONS TO EACH AMINE LOWER ALKYL

James H. Ewen, and Thomas R. McClellan, both of Seabrook, Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 27, 1980, Ser. No. 181,720
Int. Cl.[3] C08G 18/14
U.S. Cl. 521—163 11 Claims

1. In an elastomeric polyurethane-polyurea polymer prepared by the catalyzed reaction of an organic polyisocyanate, a polyol and an extender mixture comprising an aromatic polyamine and a low molecular weight diol the improvement which comprises employing in said reaction, with said organic polyisocyanate

A. a polyol having a primary hydroxyl functionality of from about 2 to about 4 and a molecular weight of from about 1500 to about 12,000, and

B. an extender mixture comprising,

(i) an aromatic diamine wherein at least one of the positions ortho to each amine group of said diamine is substituted by a lower alkyl group, and

(ii) a low molecular weight diol provided that said aromatic diamine comprises from about 5 to about 45 percent by weight of said extender mixture with the balance of from about 55 to about 95 percent by weight comprising the diol extender, and

wherein the equivalent proportions of said polyol (A) to said extender mixture (B) is within the range of about 1:4 to about 1:50, and the ratio of isocyanate equivalents to the total active hydrogen equivalents of said polyol, said aromatic diamine, and said diol is from about 0.85 to about 1.35.

4,296,213
POLYURETHANE FOAMS USING A POLYUREA POLYMER POLYOL

Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 86,365, Oct. 17, 1979, abandoned. This application Oct. 31, 1980, Ser. No. 202,892

Int. Cl.³ C08G *18/14, 18/50, 18/32*

U.S. Cl. 521—166 **11 Claims**

1. A polyurea polymer polyol made by the reaction of a hydroxyl-containing amine, a polyether polyol of about 3000 to 8000 molecular weight and an organic polyisocyanate wherein the ratio of moles of hydroxyl containing amine to moles of polyether polyol ranges from about 0.5 to 3.5 and the ratio of moles of active hydrogens to moles of isocyanate groups ranges from about 1.4 to 3.5.

6. A method for producing a polyurethane which comprises first making a polyurea polymer polyol by reacting a hydroxyl-containing amine, a polyether polyol and an organic polyisocyanate wherein the ratio of moles of hydroxyl containing amine to moles of polyether polyol ranges from about 0.5 to 3.5 and the ratio of moles of active hydrogens to moles of isocyanate groups ranges from about 1.4 to 3.5 and then reacting said polyurea polymer polyol with an organic polyisocyanate.

4,296,214
METHACRYLIC RESIN HAVING A HIGH SOLAR RADIANT ENERGY ABSORBING PROPERTY AND PROCESS FOR PRODUCING THE SAME

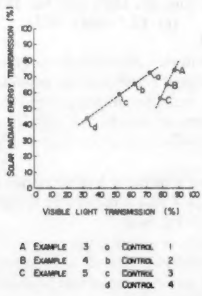
Kazumasa Kamada; Yoshio Nakai, and Kazunori Abe, all of Ootake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 139,441

Claims priority, application Japan, Apr. 20, 1979, 54-49240

Int. Cl.³ C08K *5/09, 5/52*

U.S. Cl. 525—2 **22 Claims**



1. A methacrylic resin having a high solar radiant energy absorbing property wherein an organic compound (A) containing cupric ion in an amount of 0.01 to 5 parts by weight calculated as cupric ion and a compound (B) having at least one P—O—H bond in a molecule in an amount to be 0.1 to 10 mols per mol of the above mentioned organic compound (A) are contained per 100 parts by weight of a methacrylic resin selected from homopolymer of methyl methacrylate or copolymers of polymerizable unsaturated monomer mixture containing at least 50% by weight of a methyl methacrylate.

4,296,215
METHOD TO THICKEN DISSOLVED THERMOSET RESINS

Kenneth H. Markiewitz, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 928,691, Jul. 27, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 137,896

Int. Cl.³ C08L *75/06, 67/06, 63/02*

U.S. Cl. 525—28 **28 Claims**

1. A method of increasing the viscosity of a uniformly dispersed or solubilized composition comprising (A) at least 10 percent by weight of a polymerizable resin selected from the class consisting of a vinyl urethane resin and an unsaturated polyester resin which resin is curable to a thermoset resin and has a molecular weight of at least 500, and (B) up to 90% by weight of an ethylenically unsaturated monomer, which method comprises mixing into the composition an amount of at least 2% by weight of the composition of a polyisocyanate and a catalytic amount of a trimerization catalyst selected from the class consisting of quaternary ammonium hydroxides, quaternary ammonium acetates, quaternary ammonium formates, alkali metal acetates and alkali metal formates, and trimerizing the polyisocyanate in the composition.

4,296,216
THERMOPLASTIC RESIN COMPOSITION

Hajime Sakano, Hiroʼata; Mikio Kodama, Takatsuki; Koichi Nakayama; Isao Yoshida, both of Amagasaki, and Atsunori Inoue, Takatsuki, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Mar. 5, 1980, Ser. No. 127,287

Int. Cl.³ C08L *55/02, 77/00, 59/02, 59/04*

U.S. Cl. 525—66 **1 Claim**

1. A thermoplastic resin composition consisting essentially of (A) at least one of polyamide resins and polyacetal resins, (B) at least one of aromatic monovinyl compound/vinyl cyanide copolymers comprising units of aromatic monovinyl compounds and units of vinyl cyanides in a weight ratio of 60:40 to 80:20 and having an intrinsic viscosity of 0.3 to 1.1 and (C) at least one of conjugated diene rubber/vinyl cyanide graft copolymers comprising units of conjugated diene rubbers in an amount of 5 to 45% by weight based on the weight of the graft copolymers in a weight proportion of the components (A), (B) and (C) being respectively 0.1–10:5–90:5–94.9.

4,296,217
AROMATIC POLYETHERSULPHONES HAVING —OCH_2COR END GROUPS

John Stuart-Webb, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1979, Ser. No. 14,249

Claims priority, application United Kingdom, Feb. 28, 1978, 7865/78

Int. Cl.³ C08G *65/48*

U.S. Cl. 525—390 **6 Claims**

1. An aromatic polyethersulphone containing repeat units of the general formula

—E—O—E′—O—

or, where E is the same as E′,

—E—O—

in which E is the residuum obtained by the removal of the halogen atoms of a dihalobenzenoid compound in which each halogen atom is activated by an —SO_2— group ortho or para thereto, and E′ is the residuum obtained by removal of the hydroxyl groups from a bisphenol; or where E is the same as E′, it is the residuum obtained by the removal of the halogen atom and the hydroxyl group from a halophenol in which the halogen atom is activated by an —SO_2— group ortho or para thereto, said polyethersulphone having from 3 to 20 end

groups of the formula —OCH_2COR where R is alkyl or alkoxy, per 100 repeat units.

4,296,218

HEAT-CURABLE AND SOLVENT-SOLUBLE ESTER GROUP-CONTAINING POLYMER COMPOSITIONS AND PROCESS FOR THEIR PREPARATION

Shigeyoshi Hara, and Tateyoshi Yamada, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 894,006, Apr. 6, 1978, Pat. No. 4,251,649, which is a division of Ser. No. 593,644, Jul. 7, 1975, Pat. No. 4,137,221. This application Apr. 23, 1980, Ser. No. 143,161

Claims priority, application Japan, Jul. 11, 1974, 49-78672; Sep. 30, 1974, 49-111649

Int. Cl.[3] **C08L** *67/02;* **C08J** *3/00*

U.S. Cl. 525—439 **16 Claims**

1. A process for producing a heat-curable and solvent soluble ester group containing polymer composition which comprises:

(1) reacting a highly polymerized linear aromatic polyester having an intrinsic viscosity (η), measured on an o-chlorophenol solvent at 35° C., of above 0.3 (component 1) with 10 to 70 mole percent, based on the total amount, in moles of dibasic acid contained in the polyester, of a diaryl carbonate (component 2) in the presence of a compound (component 3) containing at least two functional groups selected from the group consisting of (a) a carboxyl group or its functional derivatives, (b) a cyclic carboxylic anhydride group or its precursors, (c) a primary or secondary amino group, (d) an isocyanate group or its stabilized group or precursors, (e) an iminoacetic acid group or its functional derivatives, and (f) an hydroxyl group, to depolymerize the polyester and form a modified solvent-soluble low molecular weight polyester (component A') in which at least 30 mole percent of the entire terminal groups are aryl carboxylate groups,

(2) mixing a monomeric or solvent soluble low molecular weight polymeric condensation product of at least two species of component 3 (component C) in which the main chain includes at least one linkage selected from the group consisting of amide, imide, hydantoin and ester linkages and at least 50 mole percent of the entire terminal groups and carboxyl groups or functional derivatives thereof, with component A' to form a mixture (D), and

(3) (i) mixing or (ii) partially reacting the mixture (D) with a monomeric or polymeric solvent-soluble polyfunctional compound (component B) containing at least two reactive groups selected from the group consisting of hydroxyl, primary amino and secondary amino.

4,296,219

BISMIDE-ETHER COMPOUNDS, COMPOSITIONS THEREOF, AND METHOD OF PRODUCING SAME

Akio Takahashi; Yutaka Itoh; Motoyo Wajima; Hirosada Morishita, and Akio Nishikawa, all of Ibaraki, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

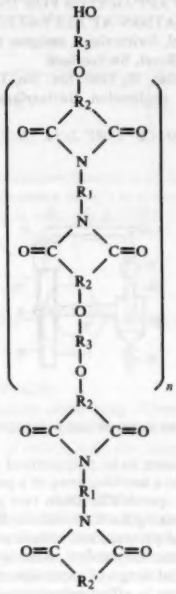
Filed Jan. 22, 1979, Ser. No. 5,233

Claims priority, application Japan, Mar. 31, 1978, 53-36592; Jun. 7, 1978, 53-67712

Int. Cl.[3] **C08G** *73/12*

U.S. Cl. 525—488 **40 Claims**

1. A bisimide-ether compound having the general formula:



wherein R_1 is a group containing at least two carbon atoms, the nitrogen atoms of the imide rings being directly connected to different carbon atoms of the group R_1, R_2 is a group containing at least two carbon atoms, the carbonyl groups of the imide rings being directly connected to different carbon atoms of the group R_2, R'_2 is a group containing at least two carbon atoms and a carbon-carbon double bond, R_3 is an aromatic group, the oxygen atoms between the groups R_2 and R_3 being directly connected to different carbon atoms of the aromatic nucleus of the group R_3, and n is an integer of zero, 1 or larger than 1, the bisimide ether compound being soluble in an organic solvent having a boiling point not higher than 130° C. at normal temperature and under normal pressure.

4,296,220

METHOD FOR PREPARING VINYL ESTER RESINS

Harold O. Seeburger; Ralph G. Beattie, and Violete L. Stevens, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 2, 1980, Ser. No. 155,882

Int. Cl.[3] **C08G** *8/32;* **C07C** *57/00, 69/54*

U.S. Cl. 525—507 **11 Claims**

1. A process for preparing vinyl ester resins wherein a hydroxy phenolic compound is reacted in the presence of a basic catalyst with tertiary alkyl glycidyl ether and the resulting reaction product is dealkylated and esterified with an ethylenically unsaturated carboxylic acid.

4,296,221
PROCESS AND APPARATUS FOR INTERMITTENT POLYMERIZATION AT ELEVATED PRESSURE

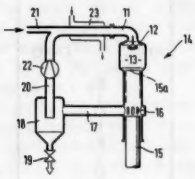
Helmut Bauer, Basel, Switzerland, assignor to Maschinenfabrik Burckhardt AG, Basel, Switzerland

Filed Mar. 28, 1980, Ser. No. 135,122

Claims priority, application Switzerland, Apr. 26, 1979, 3960/79

Int. Cl.³ C08F *2/34, 10/02*

U.S. Cl. 526—87 **15 Claims**



1. A process for an intermittent polymerization comprising the steps of

supplying a substance to be polymerized in gaseous form in timed relation to a working zone of a pump or compressor volumetrically operable between two pressure stages;

thereafter compressing the substance in the working zone to a predetermined pressure and temperature; and

adding a polymerization catalyst to the working zone at the latest in an initial range of expansion of the substance in the working zone to effect polymerization.

4,296,222
MANUFACTURE OF POLY-α-OLEFINS

Gerhard Staiger, Bobenheim-Roxheim, and Klaus Bronstert, Carlsberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1977, Ser. No. 780,764

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616260

Int. Cl.³ C08F *4/66, 10/06*

U.S. Cl. 526—119 **8 Claims**

1. In a process for the manufacture of an α-olefin polymer by polymerizing one or more α-olefins at from 0° to 150° C. and from 1 to 100 atmospheres absolute by means of a catalyst system comprising (1) a titanium-containing component obtained from (1.1) a compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ having a maximum particle diameter of 2 mm and (1.2) an organic electron donor, containing one or more phosphorus, nitrogen and/or oxygen atoms, which has been milled with the compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ (1.1) to form a complex compound, and (2) an aluminum-containing component consisting of a compound of the formula $Al(C_nH_{2n+1})_3$ or $Al(C_nH_{2n+1})_2Cl$ or a mixture of such compounds, n being, in each case, an integer from 2 to 6, with the provisos that the molar ratio of titanium contained in the compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ (1.1) to the electron donor (1.2) is from 10:5 to 10:1 and the molar ratio of titanium contained in the compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ (1.1) to the aluminum-containing component (2) is from 10:5 to 10:300, the catalyst system employed being a system in the preparation of which the milling of the compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ (1.1) with the electron donor (1.2) has been carried out without assistants or additives in a vibratory ball mill with steel balls of from 6 to 60 mm diameter under a milling acceleration of from 30 to 70 $m.sec^{-2}$ for a period of from 10 to 70 hours at a temperature which is from 4° to 10° C. below the temperature at which the particles of the material being ground begin to agglomerate, the improvement wherein the titanium-containing catalyst component (1) of the catalyst system used is one which has been treated with from 0.2 to 2.0 parts by weight of (i) titanium tetrachloride per part by weight of the untreated catalyst component (1) and (ii) from 0.15 to 1.5 parts by weight of an ether and/or ester per part by weight of the untreated catalyst component (1) after milling and before the polymerization.

4,296,223
POLYMERIZATION OF OLEFINS

Eugene Berger, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 658,682, Feb. 17, 1976, abandoned, which is a continuation of Ser. No. 372,073, Jun. 21, 1973, abandoned. This application Oct. 8, 1980, Ser. No. 195,093

Claims priority, application Luxembourg, Jun. 22, 1972, 65587

Int. Cl.³ C08F *4/02, 10/02*

U.S. Cl. 526—125 **17 Claims**

1. A solid catalytic complex comprising the solid reaction product formed by reacting together

(A) at least one reagent selected from magnesium dichloride and magnesium dichloride hydrate; with

(B) at least one reagent which is a halogen-free titanium alkoxide containing C_1–C_{20} organic radicals bonded to the metal via oxygen; and with

(C) at least one reagent which is an alkyl aluminium chloride having the general formula AlR'_nX_{3-n} in which R′ is a hydrocarbon radical containing 1 to 20 carbon atoms, X is a chloride and n is any number such that $1 \leqq n \leqq 2$.

4,296,224
PERFLUOROALKYL-ACR[METHACR]YLATE, HYDROXY-CHLOROPROPYL-ACRYLATE POLYMER

Shosin Fukui, Shinsenrihigashi, and Tadashi Akazawa, Osaka, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 26, 1979, Ser. No. 79,217

Claims priority, application Japan, Sep. 28, 1978, 53-119694

Int. Cl.³ C08F *220/38, 220/30*

U.S. Cl. 526—243 **6 Claims**

1. A water and oil repellent consisting essentially of a copolymer comprising units of (a) at least 25% by weight of at least one of perfluoroalkyl group-containing acrylates and methacrylates and of (b) from 0.1 to 10% by weight of at least one of 2-hydroxy-3-chloropropyl acrylate and methacrylate of the formula:

$$CH_2{=}CRCOOCH_2CH(OH)CH_2Cl$$

wherein R is hydrogen or methyl.

4,296,225
STABLE VINYL ACETATE AND AMINE MONOMER COPOLYMER EMULSIONS

David Rhum, Old Lyme, Conn., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 4, 1980, Ser. No. 109,574

Int. Cl.³ C08F *2/30, 2/24, 20/34*

U.S. Cl. 526—260 **2 Claims**

1. A process for preparing a stable aqueous emulsion composition adapted for application as a wet abrasion-resistant paper coating binder which comprises simultaneously adding to an aqueous medium containing a vinyl polymerization catalyst a combination of copolymerizable monomer components comprising (1) between about 70–95 weight percent of vinyl acetate; (2) an aqueous solution of between about 0.5–10 weight percent of vinyl monomer containing an aliphatic amine-acid salt group; and (3) 0.5–20 weight percent of at least one other vinyl monomer, all based on total monomer weight; wherein the aqueous solution of amino-containing vinyl monomer is added as a separate feedstream.

4,296,226

VINYL POLYMER WITH ACETYLACETOXY GROUPS, PROCESS FOR ITS MANUFACTURE AND AN AGENT OBTAINED THEREOF

Helmut Braun, Kriftel; Helmut Rinno, Hofheim am Taunus, and Karl J. Rauterkus, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

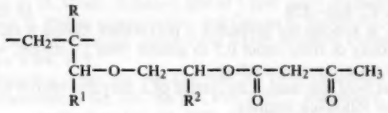
Filed Jul. 9, 1980, Ser. No. 167,052

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927932

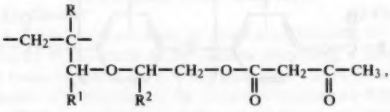
Int. Cl.³ C08F *16/38, 216/38*

U.S. Cl. 526—316 **5 Claims**

1. A vinyl copolymer having acetylacetoxy groups, which contains units of formula (I)



and/or of formula (II)



in which R is a hydrogen atom or a methyl group, R^1 is a hydrogen atom or an alkyl group having 1, 2 or 3 carbon atoms, and R^2 is a hydrogen atom or a hydrocarbon radical having from 1 to 8 carbon atoms and optionally containing one or several oxygen atoms or a halogen atom.

4,296,227

CURABLE POLYETHER RESINS

Harold O. Seeburger; George J. Atchison, and Violete L. Stevens, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 31, 1980, Ser. No. 117,154

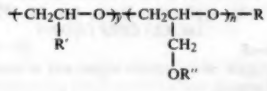
Int. Cl.³ C08G *65/32*

U.S. Cl. 526—320 **9 Claims**

1. A curable polyether compound of theoretical molecular weight less than 60,000 of the formula XA_m wherein:

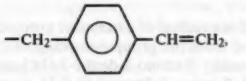
X is the residue left by the removal of m active hydrogen atoms from an initiator compound XH_m; and

a is a moiety of the formula



where:

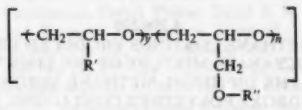
R is independently each occurrence selected from



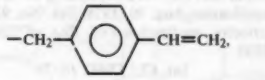
$-CH_2-CH=CH_2$ and hydrogen;

R′ is independently each occurrence selected from hydrogen, halogen C_{1-4} alkyl or haloalkyl and phenyl;

R″ is independently each occurrence a chain-terminating moiety selected from R, tertiary butyl, hydrogen, and a saturated or unsaturated ester functionality, or a chain-propagating moiety of the formula



and y and n are numbers from zero to 500 provided that in at least one occurrence of A n is at least one, and further provided that in at least one occurrence of A, R or R″ is



or $-CH_2-CH=CH_2$.

7. A curable mixture comprising Component (a) a compound of claim 1, and Component (b) an unsaturated reactive compound capable of curing with the compound of claim 1.

4,296,228

ROOM TEMPERATURE CURABLE COMPOSITIONS

Ernst Innertsberger; Oswin Sommer; Erhard Bosch; Johann Müller, all of Burghausen, and August Schiller, Marktl, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,230

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911301

Int. Cl.³ C08G *77/04*

U.S. Cl. 528—33 **10 Claims**

1. A curable composition which is stable under anhydrous conditions but when exposed to moisture at room temperature, cures to an elastomer comprising a diorganopolysiloxane having terminal condensable groups and a silicon compound containing acetoxy, tert-butoxy and SiC-bonded alkyl groups, in which at least a portion of the silicon compound containing acetoxy, tert-butoxy and SiC-bonded alkyl groups is obtained from the reaction of an alkyltriacetoxysilane with tert-butanol in the presence of aqueous acetic acid.

4,296,229

HOT-MELT POLYESTERIMIDE-POLYISOCYANATE ELECTRICAL COATING COMPOSITIONS

Denis R. Pauze, Scotia, and Otto S. Zamek, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 30, 1980, Ser. No. 154,838

Int. Cl.³ C08G *18/80, 18/42;* **C08F** *283/04*

U.S. Cl. 528—45 **6 Claims**

1. A composition for hot-melt electrical wire coating comprising:

a high solids content resinous polyester-imide-polyisocyanate reaction product obtained by heating ingredients comprising

(a) an aromatic diamine;

(b) an aromatic carboxylic anhydride containing at least one additional carboxylic group;

(c) terephthalic acid or a reactive derivative thereof;

(d) a polyhydric alcohol having at least three hydroxyl groups;

(e) an alkylene glycol; and a small amount of

(f)(i) an alkylene glycol monoether or monoester;

(ii) a polyalkylene glycol monoether or monoester; or

(iii) a mixture of (i) and (ii),

until an acid number of lower than 6 to 7 is attained, and adding to the hot reaction product a blocked polyisocyanate in an

amount of 1 to 40 parts by weight per 100 parts by weight of the polyesterimide and blocked polyisocyanate.

4,296,230

POLYURETHANE COATINGS PRODUCED FROM (1) A POLYISOCYANATE MIXTURE OF POLYISOCYANATES FROM THE DIPHENOL METHANE SERIES AND A POLYHYDROXY POLYETHER CONTAINING AT LEAST ONE TERTIARY AMINE NITROGEN WITH (2) A POLYOL IN A TWO COMPONENT COATING SYSTEM

Jösef Pedain, Cologne; Walter Uerdingen, Bergisch-Gladbach, and Hans-Jürgen Müller, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 747,568, Dec. 6, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 938,165

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555535

Int. Cl.³ C08G *18/76*

U.S. Cl. 528—67 **15 Claims**

1. A process for the production of coatings by coating substrates of any type with a coating composition of which the binder consists essentially of a mixture of:

(a) a polyisocyanate component and

(b) at least one organic polyhydroxyl compound, wherein the polyisocyanate component (a) is a reaction product obtained from:

(i) a polyisocyanate mixture which, in addition to from about 20 to 80%, by weight, of 2,4'-diisocyanato diphenyl methane, contains a total of from about 80 to 20%, by weight of 2,2'-diisocyanato diphenyl methane, 4,4'-diisocyanato diphenyl methane, and optionally, higher nuclear polyisocyanates of the diphenyl methane series, and

(ii) a polyhydroxy polyether containing at least one tertiary amine nitrogen atom and having an average molecular weight of from about 500 to 10,000 or a polyhydroxy polyether mixture containing at least one such polyhydroxy polyether and having an average molecular weight of from about 500 to 10,000, components (i) and (ii) having been reacted in an NCO:OH equivalent ratio of from about 300:1 to 10:1 to form a reaction product containing free isocyanate groups and urethane groups.

4,296,231

CURABLE EPOXIDE RESIN MIXTURES

Ferdinand Gutekunst, Rieher, and Rolf Schmid, Gelterkinden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

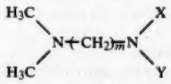
Filed May 1, 1980, Ser. No. 145,406

Claims priority, application Switzerland, May 8, 1979, 4307/79

Int. Cl.³ C08G *59/64*

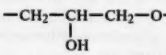
U.S. Cl. 528—93 **10 Claims**

1. A curable mixture comprising a polyepoxide compound having on average more than one epoxide group in the molecule, and optionally a polycarboxylic acid, an anhydride or a polyhydric phenol as the curing agent, the said mixture additionally containing a compound of the formula I



(I)

in which m is a number from 3 to 10, X is a group of the formula



in which R is an alkyl having 4 to 10 C atoms or a phenyl which is unsubstituted or substituted by chlorine, bromine or alkyl or alkoxy each having 1 to 3 C atoms, and Y is a hydrogen atom or has the meaning defined for X, as the curing catalyst or as the curing accelerator for curing the epoxide compound with di- or poly-carboxylic acids or anhydrides of di- or poly-carboxylic acids or with polyhydric phenols.

4,296,232

PROCESS FOR PREPARING POLYARYLATES IN THE PRESENCE OF A DIPHENYL ETHER COMPOUND AND A CATALYST

Louis M. Maresca, Belle Mead; Peter J. Gill, North Brunswick, and Mitchell H. Berger, Somerville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

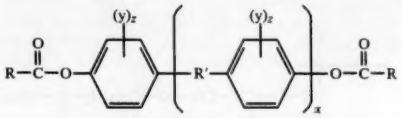
Filed Aug. 27, 1979, Ser. No. 70,039

Int. Cl.³ C08G *63/18, 63/28, 63/30, 63/66*

U.S. Cl. 528—179 **19 Claims**

1. A process for preparing a polyarylate having a reduced viscosity of from about 0.5 to greater than 1.0 dl/gm, which process comprises reacting:

(a) at least one diester derivative of a dihydric phenol having the following formula:



wherein R is independently selected from an alkyl radical having from 1 to about 6 carbon atoms or cycloalkyl having from 4 to about 7 carbon atoms, y is independently selected from alkyl groups of 1 to 4 carbon atoms, chlorine, or bromine, z independently has a value of from 0 to 4, inclusive, and R' is independently selected from a divalent saturated aliphatic hydrocarbon radical having 1 to 8 carbon atoms, a cycloalkylene, or cycloalkylidene radical having up to and including 9 carbon atoms, O S, SO, SO_2, CO, x is 0 or 1; with

(b) at lease one aromatic dicarboxylic acid, in the presence of from about 10 to about 60 weight percent, based on the polyarylate produced, of a diphenyl ether compound, at a temperature of from about 260° to about 350° C. and in the presence of a catalytically effective amount of a magnesium catalyst.

4,296,233

CONJUGATE OF AMINO SUGAR-STEROID HORMONE

Satoru Enomoto, Fujisawa; Kiro Asano, Kukizaki, and Hiromitsu Tanaka, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

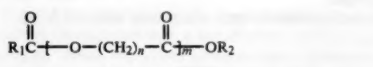
Filed Mar. 29, 1979, Ser. No. 25,073

Claims priority, application Japan, Apr. 14, 1978, 53-44034

Int. Cl.³ C07J *17/00*

U.S. Cl. 536—5 **5 Claims**

1. A conjugate of an amino sugar and a steroid hormone having the formula:



wherein R_1C is a radical of a carboxyl group containing amino sugar selected from the group consisting of 2-amino-2-deoxy-glucuronic acid, 2-amino-2-deoxy-3-O-(1-carboxyethyl) D-glucose and 2-amino-2-deoxy-3-O-β-D-glucopyranurosyl-D-galactose; R_2 is a radical of a steroid hormone selected from the group consisting of 17β-hydroxy-4-androsten-3-one; 3β-hydroxy-5-androsten-17-one; 1,3,5 (10)-estratriene-3,17 β-diol; 5β-pregnane-3α, 20α-diol; 4-pregnene-3, 20-dione; 11β, 17α, 21-trihydroxy-4-pregnene-3, 20-dione; 11β, 21-dihydroxy-4-

pregnene-3,20-dione; prednisone; desoxymethasone, mestanolone; androstanolone; unsodeoxycholic acid methanedienone; β-sitosterol and Alphaxalone, the bonding between said amino sugar radical and said steroid hormone radical occurring only at the 3 or 17 position of said steroid radical; m is 0 or 1 and n is 1 or 2.

4,296,234

ABSORBENT MATERIALS

Lothar F. O. Mindt, deceased, late of Upper Dean, England; by Peter R. Payne, administrator, and George R. Sanderson, both of Bedford, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 960,423, Nov. 13, 1978, abandoned, and a continuation of Ser. No. 766,524, Feb. 7, 1977, abandoned. This application Apr. 23, 1980, Ser. No. 142,908

Claims priority, application United Kingdom, Dec. 19, 1973, 58917/73; Dec. 19, 1973, 58918/73; Jul. 17, 1974, 31672/74

Int. Cl.³ A61L *15/00;* **C08B** *31/00*

U.S. Cl. 536—47 **43 Claims**

1. A highly absorbent material which is substantially dry and non-sticky to the touch in the swollen state being a substantially water-insoluble cross-linked gelatinised starch, in which the degree of substitution of the cross-linking groups is 0.001 to 0.02, which is substituted by ionic groups which are attached to the starch by ether linkages and which groups are associated with counterions selected from mono- and divalent counterions, and which has a urine retention value of at least 8 g/g.

4,296,235

PROCESS FOR THE REMOVAL OF ALKALI METAL HALIDES FROM CELLULOSE ETHERS SOLUBLE IN COLD WATER AND USE OF THE PURIFIED PRODUCTS IN WASHING AND CLEANSING AGENT COMPOSITIONS

Horst Ziche, Dusseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft Auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,901

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912486

Int. Cl.³ C08B *11/20, 11/22*

U.S. Cl. 536—85 **5 Claims**

1. A process for the purification of cold-water soluble cellulose ethers containing alkali metal halides consisting essentially of suspending a cold-water-soluble cellulose ether crude reaction product containing 25% by weight or more of alkali metal halides, based on the dry weight, where said cellulose ethers are selected from the group consisting of methyl cellulose, ethyl cellulose, mixed methyl/ethyl cellulose, mixed ethyl/hydroxyethyl cellulose, mixed ethyl/hydroxypropyl cellulose and mixed ethyl/dihydroxypropyl cellulose, in an aqueous solution containing from 4% to about 25% by weight of one or more water-soluble salts selected from the group consisting of alkali metal sulfates, alkali metal phosphates, alkali metal silicates and alkali metal carbonates, with agitation at a temperature of from 10° C. to 50° C., separating the purified cellulose ether solids and repeating the suspending and separating steps zero, one or more times.

4,296,236

7-(OR 6-) SUBSTITUTED-7-(OR 6-)ACYLIMINO CEPHALOSPORIN (OR PENICILLIN) COMPOUNDS

Burton G. Christensen, Scotch Plains; David B. R. Johnston, Warren, and Raymond A. Firestone, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

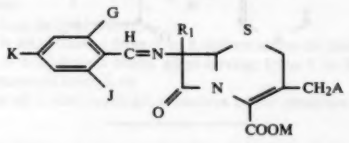
Division of Ser. No. 243,057, Apr. 11, 1972, Pat. No. 3,875,146. This application Jan. 9, 1975, Ser. No. 539,881

Claims priority, application United Kingdom, Apr. 30, 1971, 13008/71; Sep. 1, 1971, 40813/71; Sep. 1, 1971, 40814/71; Nov. 29, 1971, 55232/71

Int. Cl.³ C07D *499/02, 501/14*

U.S. Cl. 542—420 **7 Claims**

1. The compound having the formula:



wherein M is benzyl, benzhydryl, trichloroethyl, methoxybenzyl; A is hydrogen, acetoxy, or pyridinium; each of G, K and J are hydrogen, halo, or nitro; and R_1 is loweralkylthio.

4,296,237

4-(PYRIDYL, PIPERAZINYL AND THIAZOLYL SUBSTITUTED THIAZOLYL)-3-HYDROXY-3-PYRROLINE-2,5-DIONES

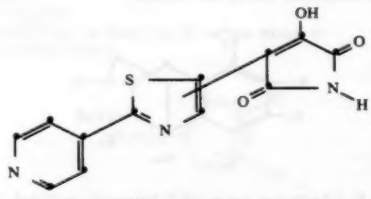
Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worchester, both of Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 11, 1979, Ser. No. 74,466

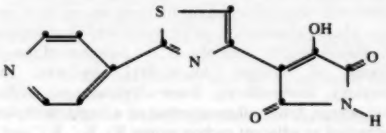
Int. Cl.³ C07D *417/14;* **A61K** *31/425, 31/44, 31/495*

U.S. Cl. 544—405 **5 Claims**

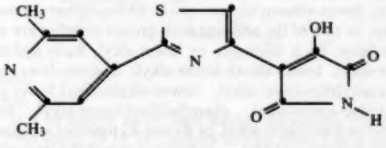
1. The compounds having the structure:



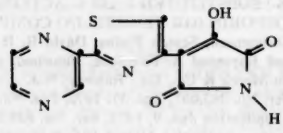
2. The compound having the structure:



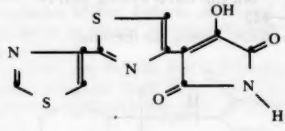
3. The compound having the structure:



4. The compound having the structure:



5. The compound having the structure:



4,296,238

2,6-METHANO-3-BENZAZOCINES

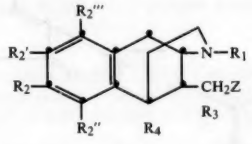
William F. Michne, Poestenkill, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 9,594, Feb. 5, 1979, Pat. No. 4,255,579, which is a continuation-in-part of Ser. No. 877,166, Feb. 13, 1978, Pat. No. 4,180,667, which is a continuation-in-part of Ser. No. 741,227, Nov. 12, 1976, Pat. No. 4,100,164, which is a continuation-in-part of Ser. No. 695,977, Jun. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 576,313, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 471,571, May 20, 1975, Pat. No. 3,932,422. This application May 7, 1980, Ser. No. 147,084

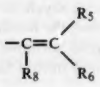
Int. Cl.[3] C07D *221/26*

U.S. Cl. 546—97 **21 Claims**

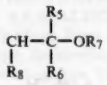
1. A compound having the formula



where R_1 is hydrogen, lower-alkyl, lower-alkanoyl (only when R_4 is hydrogen), lower-alkenyl, lower-alkynyl, halo-lower-alkenyl, cyclo-lower-alkyl, cyclo-lower-alkyl-lower-alkyl, 2- or 3-furylmethyl, or such 2- or 3-furylmethyl substituted on the unsubstituted ring carbon atoms by from one to three methyl groups, phenyl-lower-alkyl, or phenyl-lower-alkyl substituted in the phenyl ring by from one or two members of the group consisting of halogen, lower-alkyl, hydroxy, lower-alkanoyloxy, lower-alkoxy, lower-alkylmercapto, trifluoromethyl, amino, lower-alkanoylamino or a single methylenedioxy attached to adjacent carbon atoms; R_2, R_2', R_2'' and R_2''' are each hydrogen, or three of them are hydrogen and the fourth is halogen, lower-alkyl, hydroxy, loweralkanoyloxy, lower-alkoxy, lower-alkylmercapto, trifluoromethyl, nitro, amino, lower-alkanoylamino, lower-alkoxycarbonylamino or phenyl, or two of the adjacent such groups together are methylenedioxy; R_3 is hydrogen or lower-alkyl; R_4 is hydrogen, lower-alkyl, lower-alkoxy-lower-alkyl, hydroxy-lower-alkyl, lower-alkylthio-lower-alkyl, lower-alkylsulfinyl-lower-alkyl, phenylthio-lower-alkyl, phenylsulfinyl-lower-alkyl, lower-alkenyl or halo-lower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, $-(CH_2)_n-$, where n is one of the integers 3 or 4; and Z is the group



where either R_5 and R_6 are both lower-alkyl or one is hydrogen and the other is lower-alkyl, or a group of the formula



where R_5 and R_6 are the same or different hydrogen, lower-alkyl, cyclo-lower-alkyl-lower-alkyl, phenyl or phenyl-lower-alkyl; R_7 is hydrogen, lower-alkanoyl, benzoyl or benzoyl substituted by from one to three members of the group consisting of lower-alkyl, lower-alkoxy, hydroxy, halo or trifluoromethyl; and R_8 is hydrogen or lower-alkyl; or an acid-addition salt thereof.

4,296,239

AMINO-4H-S-TRIAZOLO[4,3-A][1,4]BENZODIAZEPINES

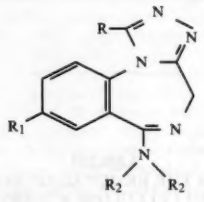
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 804,627, Jun. 8, 1977, Pat. No. 4,180,668. This application Jul. 30, 1979, Ser. No. 61,976

Int. Cl.[3] C07D *211/68*

U.S. Cl. 546—271 **3 Claims**

1. A compound of the formula



wherein

R is hydrogen, C_1 to C_3-alkyl or hydroxymethyl;

R_1 is hydrogen or a halogen having an atomic number of from 9 to 35; and the two R_2 moieties are taken together with the nitrogen to which they are bonded to complete a 3,6-dihydro-1(2H)-pyridyl nitrogen ring moiety or a pharmacologically acceptable salt thereof.

4,296,240

SILACYCLOALKANE AMIDES

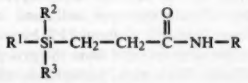
Robert E. Damon, II, Randolph, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Filed Apr. 24, 1980, Ser. No. 143,262

Int. Cl.[3] C07F *7/10*; C07D *209/10*

U.S. Cl. 556—406 **14 Claims**

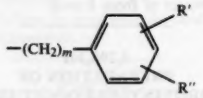
1. A compound of the formula:



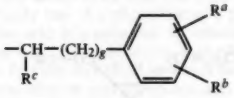
wherein R^1 is either

(a) alkyl having from 1 to 22 carbon atoms; or

(b) of the formula

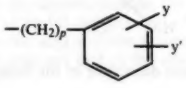


in which
m is 0, 1 or 2, and each of R′ and R″ is independently a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 127;
R^2 and R^3 are joined to form an acyclic hydrocarbon radical which together with the silicon atom forms a ring having from 3 to 20 ring members and having no more than 25 carbon atoms; and
R is of type (a) an aralkyl-type radical of the structure



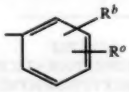
(a)

wherein g is 0, 1 or 2;
R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;
R^b is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and
R^c is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure



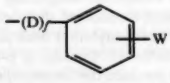
(ii)

in which p is 0, 1 or 2, and
y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and
y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or
subtype (iii) alkyl having from 1 to 8 carbon atoms; or
R is of type (b) a phenyl-type radical of the structure

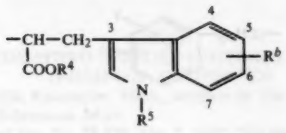


(b)

in which
R^b is as defined above, and
R^o is a hydrogen atom, halo having an atomic weight of from about 19 to 127, ie. alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or
R^o is a radical of the structure R^f:

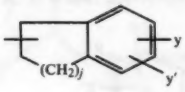


in which
D is —CH_2— or —O—;
f is 0 or 1; and
W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or
R is of type (c) an indolyl radical of the structure:



(c)

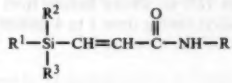
wherein
R^b is as defined above;
R^4 is alkyl having from 1 to 8 carbon atoms or benzyl; and
R^5 is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or
R is (d) a benzocycloalkyl nucleus of the structure:



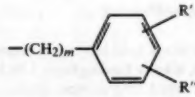
(d)

wherein
y and Y′ are as defined above; and
j is a whole integer of from 1 to 4.

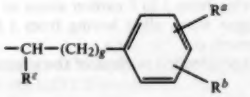
14. A compound of the formula:



wherein
R^1 is either
(a) alkyl having from 1 to 22 carbon atoms; or
(b) of the formula



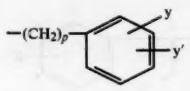
in which
m is 0, 1 or 2, and each of R′ and R″ is independently a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 127;
R^2 and R^3 are joined to form an acyclic hydrocarbon radical which together with the silicon atom form a ring having from 3 to 20 ring members and having no more than 25 carbon atoms; and
R is of type (a) an aralkyl-type radical of the stucture



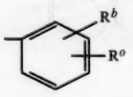
(a)

wherein
g is 0, 1 or 2;
R^a is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

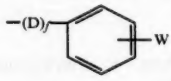
R^b is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and
R^c is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure


(ii)

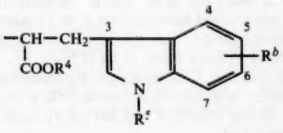
in which
p is 0, 1 or 2, and
y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and
y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or
subtype (iii) alkly having from 1 to 8 carbon atoms; or
R is of type (b) a phenyl-type radical of the structure


(b)

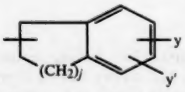
in which
R^b is as defined above, and
R^o is a hydrogen atom, halo having an atomic weight of from about 19 to 127, ie. alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or
R^o is a radical of the structure R^f:



in which
D is —CH_2— or —O—;
f is 0 or 1; and
W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or
R is of type (c) an indolyl radical of the structure:


(c)

wherein
R^b is as defined above;
R^4 is alkyl having from 1 to 8 carbon atoms or benzyl; and
R^5 is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or
R is (d) a benzocycloalkyl nucleus of the structure:


(d)

wherein
y and y′ are as defined above; and
j is a whole integer of from 1 to 4.

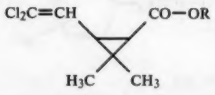
4,296,241

PREPARATION OF 3-(2,2-DICHLOROVINYL)-2,2-DIMETHYL-CYCLOPROPANE-1-CARBOXYLIC ACID DERIVATIVES

Hellmut Hoffmann; Fritz Maurer, both of Wuppertal; Uwe Priesnitz, Unna-Massen, and Hans-Jochem Riebel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

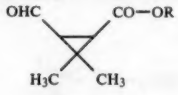
Filed Jul. 2, 1980, Ser. No. 165,871
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929725; Mar. 11, 1980, 3009242
Int. Cl.³ C07C *69/743*
U.S. Cl. 560—124 **9 Claims**

1. A process for the preparation of a 3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid or derivative of the formula

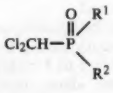


in which R is hydrogen, sodium, potassium or alkyl with 1 to 4 carbon atoms,

comprising reacting a 3-formyl-2,2-dimethyl-cyclopropane-1-carboxylic acid or a derivative of the formula



with a dichloromethane derivative of the formula



in which R^1 and R^2 each independently is alkyl, phenyl, alkoxy or phenoxy, or together are alkanediyl or alkanedioxy,

in the presence of a base at a temperature between about −50° and +50° C.

4,296,242

PROCESS FOR THE PREPARATION OF CHIRAL 3-AMINO-2-HYDROXYPROPIONIC ACID AND N-BLOCKED DERIVATIVES THEREOF

Tattanahalli L. Nagabhushan, Parsippany, and Alan Cooper, West Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 6, 1979, Ser. No. 46,076
Int. Cl.³ C07C *101/30*
U.S. Cl. 560—160 **7 Claims**

1. The process of preparing chiral 3-amino-2-hydroxypropionic acid which comprises subjecting a glycamine in an aqueous lower alkanol medium to the successive steps of
(a) cyclic 1,2-N,O-carbonylation with alkoxycarbonyl chloride, phenoxycarbonyl chloride, or p-nitrophenoxycarbonyl chloride to produce the corresponding chiral 1,2-N,O-carbonyl glycamine,
(b) periodic cleavage, and (c) permanganate oxidation to produce chiral 2,3-N,O-carbonylisoserine,

(d) acid hydrolysis to produce an acid addition salt of chiral isoserine, followed by
(e) treatment with base to neutralize the acid addition salt to produce chiral isoserine.

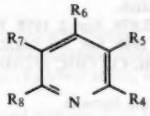
4,296,243

PROCESS FOR PRODUCING SORBIC ACID OR ITS DERIVATIVES

Kazuo Sato, Arai, Japan, assignor to Daicel Ltd., Osaka, Japan

Filed Jul. 27, 1979, Ser. No. 61,780
Claims priority, application Japan, Aug. 3, 1978, 53-95186
Int. Cl.³ C07C *51/09, 57/10, 67/08, 69/587*
U.S. Cl. 560—210 **7 Claims**

1. In a process for producing sorbic acid and its alkali salts and ester derivatives by reacting crotonaldehyde with ketene in the presence of a catalyst to form a polyester and heat-decomposing or hydrolyzing the resulting polyester addition product, the improvement wherein the catalyst in the polyester synthesizing step comprises a zinc salt of an aliphatic carboxylic acid and only one of a phosphine or a pyridine, wherein said carboxylic acid is a saturated or unsaturated carboxylic acid having at least 2 carbon atoms, said phosphine is represented by the formula $R_1R_2R_3P$ in which each of R_1, R_2 and R_3 represents an alkyl or aryl group, and said pyridine is represented by the formula:



in which each of R_4, R_5, R_6, R_7 and R_8 represents a hydrogen atom or a lower alkyl group and wherein the amount of the zinc salt of the aliphatic carboxylic acid is about 0.1 to 5.0% by weight based on the crotonaldehyde, the amount of the phosphine is about 0.3 to 1.0 mol per mol of the zinc salt of the aliphatic carboxylic acid and the amount of the pyridine is about 0.5 to 3.0 mols per mol of the zinc salt of the aliphatic carboxylic acid.

4,296,244

(3-TRIFLUOROMETHYLPHENYL)-ALPHA-HYDROXYACETIC ACID AND PROCESS FOR PREPARATION

David Y. Tang, Eggertsville, and Arthur M. Foster, Snyder, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Nov. 7, 1979, Ser. No. 92,118
Int. Cl.³ C07C *59/84*
U.S. Cl. 562—470 **6 Claims**

1. (3-trifluoromethylphenyl)-alpha-hydroxyacetic acid.

4,296,245

METHOD FOR THE PREPARATION OF A PURE ALKALI METAL BENZOATE AND BENZYL ALCOHOL

Cornelis Jongsma, Oirsbeek; Leon H. B. Frijns, Valkenburg, and Paula A. M. Raven-Donners, Sittard, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed May 16, 1980, Ser. No. 150,690
Claims priority, application Netherlands, May 17, 1979, 7903878
Int. Cl.³ C07C *51/42, 27/04*
U.S. Cl. 562—494 **26 Claims**

1. A method for the preparation of a food-grade pure alkali metal benzoate from crude benzyl benzoate, obtained by the oxidation of an alkylbenzene compound with a gas containing molecular oxygen, wherein said crude material is subjected to treatment with a reducing substance,
selected from the class of (a) hydrogen or (b) the metals with reducing properties in groups IA, IIA, IIB, IIIA, IVA, VIIB, and VIII of the periodic system in the presence of water, to convert impurities therein to alkaline-aqueous soluble components without substantial conversion of any benzyl benzoate, and subsequently saponifying said benzoate to obtain said food-grade pure alkali metal benzoate.

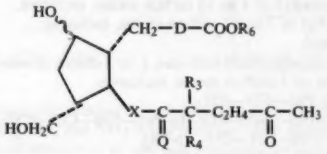
4,296,246

13,14-DIDEHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGF$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,970
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3—(CH_2)_g—CH_2—$, or
(2) $(CH_2)_3—(CH_2)_g—CF_2—$;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

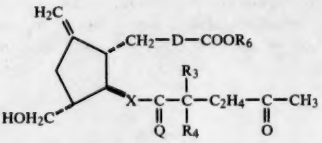
4,296,247

13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,008
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —CH_2CH_2—.

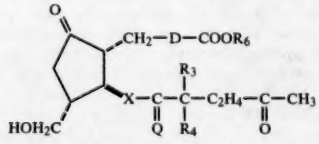
4,296,248

13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGE$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,009
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —CH_2CH_2—.

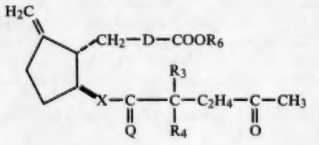
4,296,249

13,14-DIHYDRO-11-DEOXY-9-DEOXY-9-METHYLENE-19-OXO-PGE$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,029
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



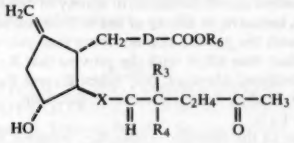
wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—CH_2—CF_2—;
wherein g is zero, one, two, or three;
wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 *L is fluoro only when the other is hydrogen or fluoro; and*
wherein X is —CH_2CH_2—.

4,296,250
13,14-DIHYDRO-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,039
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 4 Claims

1. A compound of the formula



wherein D is
(1) $(CH_2)_3—(CH_2)_g—CH_2—$, or
(2) $(CH_2)_3—(CH_2)_g—CF_2—$;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —CH_2CH_2—.

4,296,251
SYNTHESIS OF (+)-CIS-HOMOCARONIC ACID

T. L. Ho; Zia U. Din, and Carlos G. Cardenas, all of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

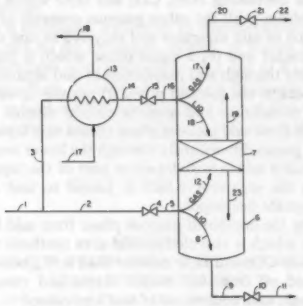
Filed May 15, 1980, Ser. No. 150,197
Int. Cl.^{3} C07C *51/34*
U.S. Cl. 562—506 7 Claims

1. A process for producing (+)-cis-homocaronic acid from 2-caren-4-ol, 2-caren-4-one, 3-caren-2-ol, or mixtures thereof comprising the steps of:
ozonizing the reactants,
treating the ozonides produced with, hydrogen peroxide and recovering (+)-cis-homocaronic acid.

4,296,252
UREA SYNTHESIS PROCESS

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Filed May 23, 1980, Ser. No. 152,534
Int. Cl.^{3} C07C *126/02*
U.S. Cl. 564—70 3 Claims



1. In a cyclic process for producing urea comprising
reacting CO_2 and NH_3 in the presence of an aqueous ammoniacal solution of at least one compound selected from the group consisting of ammonium carbonate and/or ammonium carbamate in a urea synthesis reactor at an elevated temperature of about 330° F. to about 400° F. and at a pressure from about 1,800 PSIG to about 6,000 PSIG, to form a urea synthesis reactor effluent fluid at high pressure,
lowering the pressure of said reactor effluent fluid to flash off gaseous NH_3, CO_2 and H_2O phase to obtain a residual reactor effluent solution comprising ammonium carbamate, ammonia, water and urea,
recycling at least part of said flashed off gaseous NH_3, CO_2 and H_2O phase to the urea reactor,
passing said residual reactor effluent solution to a carbamate decomposer wherein it is heated and wherein the ammonia and water vapor contained in said effluent solution is taken off in a gaseous product and wherein the ammonium carbamate is decomposed to form gaseous ammonia and gaseous carbon dioxide which is also taken off in the gaseous product,
at least part of said gaseous product from said carbamate decomposer is recycled to said urea synthesis reactor, and
a liquid product solution is withdrawn from said carbamate decomposer containing urea,
the improvment comprising splitting said urea synthesis reactor effluent fluid stream into a minor stream containing from about 5% to about 35% by weight of the total urea synthesis reactor effluent fluid stream, and a major stream containing the balance of said urea reactor effluent fluid stream,
passing said major stream through a pressure release valve to lower the pressure to the range from about 30 PSIG to about 800 PSIG and then passing said major stream at said lower pressure to the lower section of a liquid gas separator having a midsection provided with a liquid gas contact means above said lower section and an upper section above said midsection, said major stream at said lower pressure comprising (i) a gaseous phase containing NH_3, CO_2 and H_2O which rises into and through said midsection of said separator into said upper section, and is removed therefrom with the other gaseous contents thereof, and (ii) a liquid phase containing urea and unconverted ammonium carbamate which passes downthrough the lower section of said separator and is withdrawn as a liquid part of the liquid product from the separator which is passed to an ammonium carbamate decomposer,
passing said minor stream through a heat exchanger wherein

its temperature is lowered between about 40° and 80° F., and then passing said cooled minor stream through a pressure release valve to lower the pressure to substantially the pressure of the major stream as it enters said liquid gas separator and passing said minor stream having said lowered pressure to the upper section of said liquid gas separator wherein it is separated into (a) a gaseous phase containing NH_3, CO_2 and H_2O which is removed therefrom with the other gaseous contents of said upper section of said separator and recycled to said urea synthesis reactor and (b) a liquid phase which is passed downwardly through said midsection of said separator wherein it contacts the gaseous phase (i) passing upward through said midsection and absorbs carbon dioxide and water vapor from said gaseous phase (i) and said liquid phase (b) then passes downwardly through the lower section of said separator and is withdrawn as part of the liquid product from the separator which is passed to said ammonium carbamate decomposer,

whereby the combined gaseous phase from said liquid separator which is recycled to said urea synthesis reactor has a lower CO_2 and H_2O content than said gaseous phase (i) flashed off from said major stream and rising into and through said midsection of said separator,

and the combined liquid product withdrawn from the lower section of said separator containing ammonium carbamate which is passed to said carbamate decomposer, has a larger content of CO_2 and H_2O than the liquid phase (ii) of said major stream after reduction in pressure and before passing through the lower section of said separator and mixing with the liquid phase (b) of said minor stream passed downwardly through said midsection of said separator.

4,296,253

2,5-INTER-O-PHENYLENE-3,4-DINOR-PGF$_2$ AMIDES

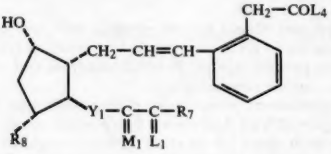
Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 62,443, Jul. 31, 1979, which is a continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,596

Int. Cl.[3] **C07C** *103/24*

U.S. Cl. 564—153 **1 Claim**

1. A prostacyclin intermediate of formula VII



wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;

wherein Y_1 is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —CH_2CH_2—, or

(4) —C≡C—,

wherein M_1 is α-R_5:β-OH or α-OH:β-R_5, wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive;

wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and α-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_7 is

(1) —$(CH_2)_m$—CH_3, wherein m is an integer from one to 5, inclusive;

(2) phenoxy;

(3) phenoxy substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;

(4) phenyl;

(5) phenyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;

(6) phenylmethyl, phenylethyl, or phenylpropyl; or

(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 **1 carbon atoms, inclusive, or alkoxy of one to** 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein L_4 is

(1) amino of the formula —$NR_{21}R_{22}$, wherein R_{21} and R_{22} are

(a) hydrogen;

(b) alkyl or one to 12 carbon atoms, inclusive;

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive;

(d) aralkyl of 7 to 12 carbon atoms, inclusive;

(e) phenyl;

(f) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or nitro;

(g) carbamoylalkyl of 2 to 5 carbon atoms, inclusive;

(h) acetylalkyl of 3 to 6 carbon atoms, inclusive;

(i) benzoylalkyl of 7 to 11 carbon atoms, inclusive;

(j) benzoylalkyl substituted by one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, or nitro;

(k) hydroxyalkyl of one to 4 carbon atoms, inclusive;

(l) dihydroxyalkyl of one to 4 carbon atoms, inclusive, or

(m) trihydroxyalkyl of one to 4 carbon atoms, inclusive;

with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl; or

(2) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and R_{21} is other than hydrogen, but otherwise as defined above.

4,296,254

TRANSETHERIFICATION IN AMIDES

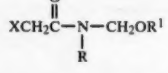
Robert E. Middlebrook, Coral Gables; George R. Harvey, Miami, both of Fla., and John P. Chupp, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 25, 1980, Ser. No. 133,752

Int. Cl.[3] **C07C** *102/00*

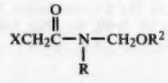
U.S. Cl. 564—214 **19 Claims**

1. Process for the preparation of N-methylene ether-substituted 2-haloacetamides having the formula



I

which comprises transetherification of N-methylene ether-2-haloacetamides of the formula



II

with a compound of the formula

R^1OH III

wherein the above formulae

X is chloro, bromo or iodo,
R is a phenyl or cycloalkenyl radical or a phenyl or cycloalkenyl radical substituted with lower alkyl, alkoxy, polyalkoxy or alkoxymethyl having up to 6 carbon atoms, halogen, NO_2, $-CF_3$ or a tetrahydrofurfuryloxy radical containing up to 6 carbon atoms and
R^1 and R^2 are different C_{1-6} alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl, alkoxyalkyl, cycloalkyl, cyanoalkyl or lower alkoxycarboalkyl radicals or 1,3-dioxolanylmethyl which may be substituted with lower alkyl groups, said transetherification being conducted in an inert solvent at elevated temperature and in the presence of an acid catalyst.

4,296,255

ACYCLIC CARBOXAMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT

David G. Roswell, Staines; David J. Spring, Datchet, and Roger Hems, Maidenhead, all of England, assignors to Wilkinson Sword Limited, London, England

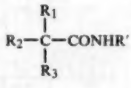
Division of Ser. No. 36,662, May 7, 1979, Pat. No. 4,230,688, which is a continuation of Ser. No. 768,219, Feb. 14, 1977, Pat. No. 4,153,679, which is a division of Ser. No. 351,357, Apr. 16, 1973, abandoned. This application Apr. 25, 1980, Ser. No. 143,948

Claims priority, application United Kingdom, Apr. 18, 1972, 17914/72

Int. Cl.[3] **C07C** *103/127, 103/38, 101/30*

U.S. Cl. 564—215 **5 Claims**

1. Monosubstituted aliphatic acyclic carboxamides of the formula



where
R_1, R_2 and R_3 are each C_1–C_5 straight or branched chain alkyl and together provide a total of at least 5 carbon atoms; and
R′ is selected from C_1–C_5 alkyl, C_1–C_8 hydroxyalkyl and alkylcarboxyalkyl of up to 6 carbon atoms.

4,296,256

2-DECARBOXY-2-HYDROXYMETHYL-19-KETO-PG COMPOUNDS

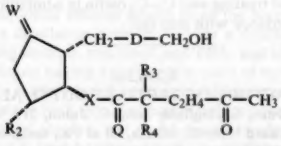
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1980. This application Mar. 20, 1980, Ser. No. 132,349

Int. Cl.[3] **C07C** *177/00*

U.S. Cl. 568—330 **262 Claims**

1. A compound of the formula



wherein D is
(1) cis-CH=CH-CH_2-$(CH_2)_g$-CH_2-,
(2) cis-CH=CH-CH_2-$(CH_2)_g$-CF_2-,
(3) cis-CH_2-CH=CH-CH_2-CH_2-,
(4) trans-$(CH_2)_3$-CH=CH-,
(5) -$(CH_2)_3$-$(CH_2)_g$-CH_2-,
(6) -$(CH_2)_3$-CH_2-CF_2-,
(7) -$(CH_2)_3$-O-CH_2-,
(8) -(CH_2)-O-$(CH_2)_2$-,
(9) -CH_2-O-$(CH_2)_3$-,
(10) -(m-Ph)-$(CH_2)_2$-, or
(11) -(m-Ph)-O-CH_2-,
wherein -(m-Ph)- is inter-meta-phenylene and
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl,
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein W is oxo, methylene, α-OH:β-H, or α-H:β-OH; and
wherein X is cis- or trans-CH=CH-, -C≡C- or -CH_2CH-.

4,296,257

PROCESS FOR PRODUCING DIHYDROCARVONE GEOMETRIC ISOMERS

Carlos G. Cardenas, and Zia U. Din, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Filed Jan. 7, 1980, Ser. No. 109,989

Int. Cl.[3] **C07C** *45/51, 45/58*

U.S. Cl. 568—361 **8 Claims**

1. A process for producing a single dihydrocarvone isomer from mixed liquid phase cis- and trans-limonene oxide isomers under limonene oxide rearrangement conditions and to the substantial exclusion of the other dihydrocarvone isomer, which comprises:
(A) separating said limonene oxide isomers by either:
(a) rearranging substantially selectively cis-limonene oxide at a temperature of from 50° C. to 95° C. in the presence of an acid catalyst to the trans-dihydrocarvone isomer and terminating this rearrangement before substantial rearrangement of the trans-limonene oxide occurs to form a reaction mixture or
(b) first fractionally distilling said limonene oxide isomers to isolate the cis-limonene oxide isomer from the trans-limonene oxide isomer as separate distillate fractions and then rearranging one of the thus-separated limonene isomer distillate fractions in the presence of from 0.1% to 10% by weight of said separated limonene oxide isomer of an acid catalyst, at a temperature of from 50° C. to 95° C., until the corresponding dihydrocarvone isomer is formed in the reaction mixture to the substantial exclusion of the other dihydrocarvone isomer,
(B) neutralizing the acid catalyst in said reaction mixture with a base, and
(C) recovering the resulting dihydrocarvone isomer from the reaction mixture.

4,296,258

PROCESS FOR THE PREPARATION OF MACROCYCLIC KETONES

Charles Fehr, Geneva; Günther Ohloff, Bernex, both of Switzerland, and Georges H. Büchi, Cambridge, Mass., assignors to Firmenich SA, Geneva, Switzerland

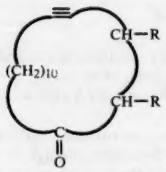
Filed Dec. 28, 1979, Ser. No. 107,847

Claims priority, application Switzerland, Jan. 26, 1979, 796/79

Int. Cl.[3] **C07C** *45/00*

U.S. Cl. 568—364 **7 Claims**

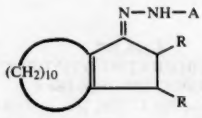
1. A process for the preparation of acetylenic macrocyclic ketones of formula



(I)

wherein one of symbols R represents a lower alkyl radical containing 1 to 3 carbon atoms and the other a hydrogen atom, which comprises

a. treating a hydrazone of formula



(II)

wherein symbols R are defined as above and A designates a sulphonyl radical of formula

$$R^1SO_2—$$ (III)

wherein R^1 stands for an aryl radical, with a halogenating reagent selected from the group consisting of

a. bromine,
b. chlorine,
c. iodine,
d. 1,3-dibromo-5,5-dimethyl-hydantoin,
e. N-bromosuccinimide,
f. N-iodosuccinimide and
g. N-chlorosuccinimide

in the presence of a lower aliphatic alcohol and at a temperature of from about −25° to about +25° C.;

b. reducing the excess of halogenating reagent by addition of reducing agent, and

c. heating the reaction mixture in an aqueous medium at a temperature of from about 20° to about 60° C.

4,296,259

PREPARATION OF A 1,4-PENTADIEN-3-OL

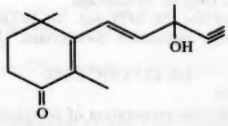
Urs Hengartner, Roseland, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 24,296, Mar. 27, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,574

Int. Cl.³ C07C *49/743*

U.S. Cl. 568—378 **1 Claim**

1. A compound of the formula:



4,296,260

PROCESS FOR THE PREPARATION OF PHLOROGLUCINOL

Rainer Zielke, Erlenbach, and Helmut Maegerlein, Obernburg, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Aug. 8, 1979, Ser. No. 64,691

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1978, 2840597

Int. Cl.³ C07C *39/10, 37/01*

U.S. Cl. 568—763 **8 Claims**

1. A process for the preparation of phloroglucinol comprising reacting hexachlorobenzene with sodium propylate in a molar ratio of hexachlorobenzene:sodium propylate of from about 1:3 to about 1:20, in an aprotic solvent, and at a temperature from about 50° to about 250° C. to form trichlorophloroglucinol tripropylether, dechlorinating the trichlorophloroglucinol tripropylether with metallic sodium to form phloroglucinol tripropylether, and hydrolyzing the phloroglucinol tripropylether to form phloroglucinol.

4,296,261

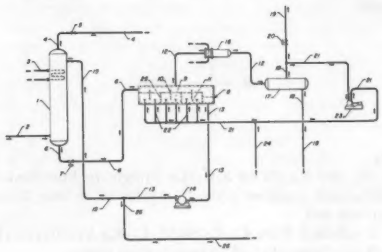
PROCESS FOR THE MANUFACTURE OF ETHANOL FROM ETHYLENE

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 9, 1980, Ser. No. 157,773

Int. Cl.³ C07C *29/12*

U.S. Cl. 568—890 **9 Claims**



1. A process for the manufacture of a C_2–C_5 alcohol which comprises the steps of:

(a) treating a C_2–C_5 olefin in an absorption zone in admixture with a C_2–C_5 alkyl hydrogen sulfate at conditions to form a C_2–C_5 dialkyl sulfate;

(b) treating said dialkyl sulfate in a hydrolyzing zone in admixture with a measured amount of water at conditions effecting the partial hydrolysis of said dialkyl sulfate and the formulation of a C_2–C_5 alkyl hydrogen sulfate and a C_2–C_5 alcohol;

(c) separating said alcohol; and,

(d) recycling the alkyl hydrogen sulfate to said absorption zone and treating said C_2–C_5 olefin in admixture therewith in accordance with step (a).

4,296,262

MANUFACTURE OF TERTIARY BUTYL ALCOHOL

Henry R. Grane, Springfield; John C. Jubin, Jr., Wallingford, and G. Richard Worrell, Media, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 45,365, Jun. 4, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,404

Int. Cl.³ C07C *29/50*

U.S. Cl. 568—910 **1 Claim**

1. The method of preparing tertiary butyl alcohol (TBA) which includes the steps of:

maintaining in an oxidation reaction zone a liquid reaction mixture comprising TBA, tertiary butyl hydroperoxide

(TBHP), and (TBHP) isobutane at conditions favoring the oxidation of isobutane to a mixture of TBA and TBHP, said conditions comprising a temperature within the range from about 240° F. to about 340° F., a pressure maintaining most of the isobutane in said oxidation reaction zone in the liquid phase, said pressure being within the range from about 100 psig to about 1000 psig, a residence time within the range from about 1 to about 10 hours, and a concentration of soluble molybdenum catalyst corresponding to about 1 to about 500 ppm of the weight of isobutane in said liquid;

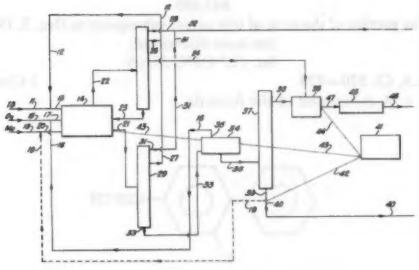
refluxing back into said reaction mixture a significant portion of any TBHP or other components boiling above TBA, while withdrawing from the oxidation reaction zone an overhead vapor stream comprising nitrogen, carbon monoxide, carbon dioxide, isobutane, acetone, methanol, water, and TBA;

selectively condensing from said overhead vapor stream a condensed TBA stream comprising acetone, methanol, water and TBA;

selectively condensing isobutane from the TBA depleted overhead vapor stream and recycling such condensed isobutane to the oxidation reaction zone;

withdrawing an isobutane-depleted overhead vapor stream comprising nitrogen, carbon monoxide, carbon dioxide from said overhead vapor stream;

directing at a controlled rate a slip stream of liquid rection mixture from the oxidation reaction zone to a debutanizing zone in which the isobutane is selectively separated and recycled to the oxidation reaction zone, said slip stream being controlled to be sufficient to maintain in the liquid oxidate in the reaction zone a concentration of high-boiling byproducts from about 1% to about 10%, said high-boiling byproducts being those, other than TBHP and TBA, which are not completely codistilled with the TBA;



directing the debutanized slip stream to a decomposition zone maintained at a temperature from about 200° to 350° F. at a pressure from about 40 to about 100 psig for a residence time of from about 1 to about 6 hours to decompose a portion of the TBHP and to increase the TBA concentration;

directing the liquid effluent stream from the decomposition zone to a distillation zone to provide a distillate stream comprising acetone, methanol, and TBA, and to provide a residual liquid having a unit weight ratio of tertiary butyl alcohol to tertiary butyl hydroperoxide greater than one, byproducts which are not completely codistilled with tertiary butyl alcohol, and molybdenum catalyst;

withdrawing at least a portion of said residual liquid stream;

directing a stream containing TBA to a cleanup zone maintained at 375°–475° F. for from 1 to 10 minutes under pressure to decompose any TBHP residues;

directing to a gasoline-blending zone a stream comprising TBA derived from the effluent stream from said cleanup zone; and

merging a debutanized distillate from the reactor overhead stream with a debutanized distillate derived from the slip stream to provide a stream containing TBA at some stage prior to the directing of a TBA containing stream to said cleanup zone.

4,296,263

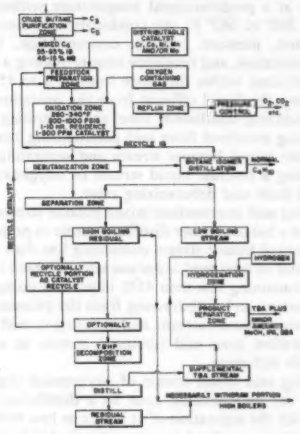
TERTIARY BUTYL ALCOHOL PRODUCTION

G. Richard Worrell, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 19, 1980, Ser. No. 188,653

Int. Cl.³ C07C *27/12*

U.S. Cl. 568—910 **1 Claim**



1. A method of preparing tertiary butyl alcohol which includes the steps of:

separating most C_3 hydrocarbons and most C_5 hydrocarbons from a mixed C_4 hydrocarbon stream in a crude butane purification zone to provide a stream of purified mixed C_4 hydrocarbons consisting essentially of from about 51 to about 85% isobutane and from about 49 to about 15% normal butane;

mixing said stream of purified mixed C_4 hydrocarbons with a stream of recycle C_4 hydrocarbons and with a catalyst stream in a feedstream preparation zone to provide a feedstream of mixed C_4 hydrocarbons, said catalyst being distributable in said mixed C_4 hydrocarbons, and said catalyst comprising a multivalent metal selected from the group consisting of chromium, cobalt, nickel, manganese, molybdenum, and mixtures thereof in a concentration of from about 1 to about 500 parts per million parts of isobutane, said catalyst stream optionally including a recycled stream derived from a high boiling stream;

maintaining in an oxidation zone, a pressurized liquid reaction mixture, said C_4 hydrocarbons derived from the feedstream being the most abundant component of said liquid reaction mixture;

directing said feedstream into said oxidation zone at a feedstream rate controlled to maintain said predominance of C_4 hydrocarbons in said liquid reaction mixture in said oxidation zone while maintaining an isobutane flow rate corresponding to a preselected residence time for the C_4 hydrocarbons;

injecting an oxygen containing gas into said oxidation zone at a normal rate stoichiometrically effective for converting to tertiary butyl alcohol at least one-sixth but less than half of said isobutane flow rate in said feedstream;

withdrawing from said oxidation zone a stream of liquid reaction mixture at a rate stoichiometrically equal, as regards C_4 components, to said feedstream rate and controlled to maintain the residence time of C_4 hydrocarbons in said oxidation zone at a predetermined residence time within a range from about 1 to about 10 hours;

maintaining the pressure in said oxidation zone at a predetermined pressure within a range from about 200 to about 1000 psig;

directing a portion of the vapors from said oxidation zone into a reflux zone and withdrawing gaseous products from said reflux zone at a rate adapted to maintain said predetermined pressure, said withdrawn gaseous products comprising oxygen and carbon dioxide;

maintaining the temperature in said oxidation zone substantially at a predetermined temperature within the range from 260° to 340° F., the combination of controlled temperature, pressure, catalyst concentration, high boiler concentration, and residence time providing a conversion of isobutane within the range from 15% to 45%;

subjecting the liquid effluent from the oxidation zone to a debutanizing distillation zone and separating and withdrawing overhead from said debutanizing zone an intermediate mixed butanes stream and separating and withdrawing a residual liquid stream of oxygenated organic liquid from said debutanizing zone;

subjecting said intermediate mixed butanes stream to distillation in a butane isomer distillation zone to prepare a residual normal butane stream containing less than 45% isobutane and an overhead isobutane stream which in isobutane and containing less than 45% impurities comprising normal butane and withdrawing from the process said residual normal butane stream, and directing to said feedstream preparation zone said isobutane stream as a stream of recycle isobutane,

subjecting said liquid stream of oxygenated organic liquid from the debutanizing zone to a distillation separation zone for the separation of at least one low boiling stream comprising overhead components selected from the group consisting of acetone, methanol, tertiary butyl alcohol, methyl ethyl ketone, methyl formate, ethyl formate, isopropyl formate, methyl acetate, ethyl acetate, and related compounds boiling below about 194° F., and for the separation of a residual high boiling stream comprising components selected from the group consisting of water, formic acid, secondary butyl alcohol, normal butyl alcohol, tertiary butyl hydroperoxide, acetic acid, high boiling esters, and related compounds boiling above about 194° F.;

subjecting a stream comprising said low boiling stream to hydrogenation in a hydrogenation zone at mild conditions favoring minimized hydrogenation of tertiary butyl alcohol to isobutane and significant conversion of methyl ethyl ketone to secondary butyl alcohol, and acetone to isopropanol, the liquid effluent from the hydrogenation zone being directed to a product separation zone;

optionally subjecting at least a portion of said residual high boiling stream to a tertiary butyl hydroperoxide decomposition zone, the effluent from which is distilled in a post-decomposition distillation zone for separating overhead a supplemental tertiary butyl alcohol stream from a residual effluent stream and directing said supplemental tertiary butyl alcohol stream to said hydrogenation zone, said tertiary butyl hydroperoxide decomposition zone being maintained at a temperature within the range from about 200° to about 350° F. for a residence time of about 1 to about 6 hours;

withdrawing from the process at least a portion of streams selected from the group consisting of said high boiling stream from the separation zone, said residual effluent stream from the post-decomposition distillation zone, and mixtures thereof;

optionally recycling to said feedstream preparation zone a portion of streams selected from the group consisting of said high boiling stream from the separation zone, said residual effluent stream from the post-decomposition zone, and mixtures thereof, as a catalyst recycle stream;

and withdrawing in a product separation zone as the most valuable product of the process a liquid product stream containing minor amounts of isopropanol and methanol, said liquid product stream containing tertiary butyl alcohol as the principal component.

4,296,264

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

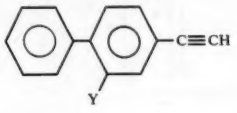
Continuation of Ser. No. 753,273, Dec. 22, 1976, which is a division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Oct. 19, 1977, Ser. No. 843,695

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.[3] **C07C** *25/06*

U.S. Cl. 570—128 **2 Claims**

1. A compound of the formula



wherein Y is halo.

2. A compound according to claim 1 which is 3-fluoro-4-phenylethynylbenzene.

4,296,265

PROCESS FOR PREPARING HEXAFLUOROPROPENE OLIGOMERS

Yohnosuke Ohsaka, Takatsuki, and Takashi Tohzuka, Settsu, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 18, 1980, Ser. No. 170,151

Claims priority, application Japan, Jul. 19, 1979, 54-91849; Aug. 15, 1979, 54-103713

Int. Cl.[3] **C07C** *17/26*

U.S. Cl. 570—138 **5 Claims**

1. A process for preparing hexafluoropropene oligomers which comprises contacting gaseous hexafluoropropene with a catalyst comprising an alkali metal fluoride supported on activated charcoal or nickel oxide.

4,296,266

PROCESS FOR THE MANUFACTURE OF LOWER OLEFINS FROM METHANOL/WATER MIXTURES

Friedrich Wunder, Flörsheim am Main; Ernst I. Leupold, Neu-Anspach; Horst Hachenberg, Walluf, and Hans-Joachim Schmidt, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 16, 1980, Ser. No. 169,629

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928922

Int. Cl.[3] **C07C** *1/00, 1/24*

U.S. Cl. 585—640 **6 Claims**

1. Process for the manufacture of C_2–C_4-olefins from methanol and/or dimethyl ether in the presence of water, on an aluminum silicate catalyst containing manganese, which comprises washing the catalyst with a solution of ethylenediaminetetraacetic acid or tartaric acid with a pH of 3 to 7.

4,296,267

Patent Not Issued For This Number

4,296,268

Patent Not Issued For This Number

4,296,269

CONTROL OF ELECTRICAL ARC FURNACES

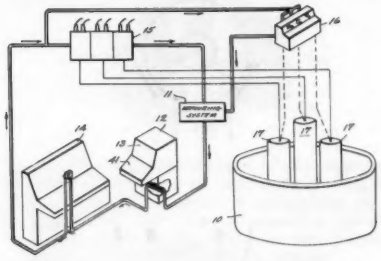
Alistair B. Stewart, and Ian J. Barker, both of Randburg, South Africa, assignors to National Institute for Metallurgy, Randburg, South Africa

Filed Jun. 13, 1978, Ser. No. 915,194

Claims priority, application South Africa, Jun. 29, 1977, 77/3923; Jan. 20, 1978, 78/0375

Int. Cl.[3] H05B 7/18

U.S. Cl. 13—12 21 Claims



1. A method for controlling operating conditions of a multiphase arc furnace, said furnace including a furnace bath, a transformer system defining a primary circuit and a secondary circuit, furnace control means, and electrodes operatively connected to the furnace control means and electrically connected to said secondary circuits, each of said electrodes, in conjunction with said furnace bath, having a reactance the method comprising the steps of:

measuring currents and voltages on at least one of said primary circuit and secondary circuit, excluding secondary phase voltages measured with respect to the furnace bath, and producing measurement signals related to said secondary circuit currents and voltages;

generating condition signals related to said operating conditions from said measurement signals on the basis that each said reactance is related to each other said reactance by an assumed relationship;

comparing the condition signals with predetermined signals; and

operating the furnace control means in accordance with any deviation of said condition signals from said predetermined signals to cause the conditioned signals to approach said predetermined signals.

4,296,270

ARRAY OF SOLAR CELLS

Kranz Köhler, Unterhaching, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH

Filed Apr. 29, 1980, Ser. No. 144,954

Claims priority, application Fed. Rep. of Germany, May 11, 1979, 2919041

Int. Cl.[3] H01L 31/04

U.S. Cl. 136—244 6 Claims

1. An improved array of solar cells of the type having a plurality of solar cells having N-type and P-type conducting zones, a plurality of contacting connectors electrically interconnecting the N-type with the P-type conducting zone of adjacent cells, each contacting connector extending outwardly from the periphery of a respective cell, the improvement wherein each of the contacting connectors comprises a foil-type ribbon having a corrugated portion extending from each solar cell; and the connectors of adjacent solar cells being overlapped and connected to each other at the corrugated portions for electrical connection but without coming into contact with adjacent solar cells.

4,296,271

GAS INSULATED HIGH VOLTAGE LINE AND METHOD OF ASSEMBLING SAME

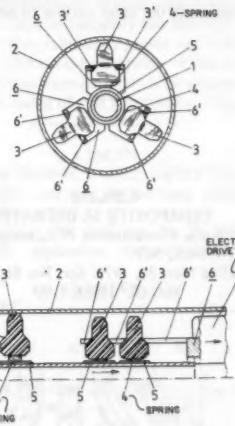
Carl D. Floessel, Fislisbach, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Apr. 1, 1980, Ser. No. 136,350

Claims priority, application Switzerland, Apr. 9, 1979, 3355/79

Int. Cl.[3] H01B 9/04, 13/20; H02G 5/06

U.S. Cl. 174—28 6 Claims



1. A gas insulated, high-voltage electric line, comprising:

a pipe jacket having an inner surface;

a conductor centrally arranged within the pipe jacket;

a plurality of insulators arranged about the periphery of said conductor; and

spring means, arranged between said insulators and said conductor, for urging each of said insulators radially outwardly toward, and into contact with, said inner surface of said pipe jacket, said spring means including

at least one carrier ring encircling said conductor, on which carrier ring said insulators are mounted, an inner diameter of which carrier ring is at least as large as an outer diameter of said conductor; and

a plurality of resilient, spring-like elements, each of which elements is interposed between said conductor and one of said insulators; and

said insulators being movable relative to said pipe jacket along a longitudinal axis of said pipe jacket.

6. A method for assembling a gas insulated, high-voltage electric line, comprising the steps of:

mounting at least first and second sets of radially directed insulators onto a conductor, each of said insulators includ-

ing a resilient member interposed between the conductor and the insulator;

simultaneously urging all of the insulators mounted on the conductor radially downwardly toward said conductor to produce a clearance between an outer end of each of said insulators and an inner surface of a pipe jacket;

moving said conductor and said at least first and second sets of insulators into an interior of said pipe jacket;

releasing all of the insulators when the first set of insulators has been moved to a first location to permit the resilient members interposed between the conductor and the first set of insulators to urge the first set of insulators radially outwardly into engagement with the inner surface of said pipe jacket;

simultaneously engaging and urging all of the insulators of the second set of insulators radially downwardly toward said conductor to produce a clearance between an outer end of each of said second set of insulators and the inner surface of said pipe jacket;

moving said conductor and said second set of insulators further into the interior of said pipe jacket; and

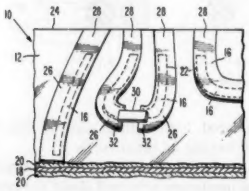
releasing all of the insulators of the second set of insulators when the second set of insulators has been moved to a second location to permit the resilient members interposed between the conductor and the second set of insulators to urge the second set of insulators radially outwardly into engagement with the inner surface of said pipe jacket.

4,296,272

COMPOSITE SUBSTRATE

Robert L. Schelhorn, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1979, Ser. No. 98,927
Int. Cl.³ H05K *1/03*
U.S. Cl. 174—68.5 **7 Claims**



1. An improved thick film composite substrate of the type having a plurality of patterned conductive layers interleaved with a plurality of electrically insulating ceramic layers and having a patterned electrically conductive layer of a refractory material on an exposed surface thereof, said original patterned conductive layer of refractory material having been shrunk during fabrication of said substrate and being substantially incapable of being functionally interconnected with means of fixed spacing, said improved substrate comprising:

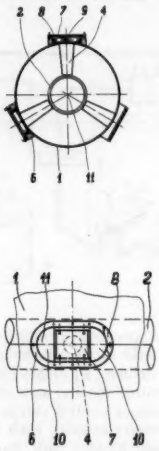
a patterned electrically conductive compensation layer generally following said original patterned conductive layer of refractory material entirely covering and extending beyond said shrunken patterned refractory material by an amount about equal to the degree of shrinkage of said original pattern whereby said patterned conductive compensation layer is functionally interconnectable with said means of fixed spacing.

4,296,273

SUPPORT ASSEMBLY FOR HIGH CURRENT BUS BARS

Zygmunt Hologa; Krystyn Madeyski, and Adam Kurowski, all of Katowice, Poland, assignors to Przedsiebiorstwo Montazu Elektrycznego "Elektrobudowa", Katowice, Poland

Filed Mar. 3, 1980, Ser. No. 126,742
Int. Cl.³ H02G *5/06*
U.S. Cl. 174—99 B **2 Claims**



1. In a support assembly for high current bus bars, including an elongated tubular enclosure having a generally circular cross-section, a plurality of insulators arranged in groups of three and being radially inwardly directed with respect to said enclosure, and spaced circumferentially 120° from each other, and means for adjustably mounting said insulators relative to said enclosure and providing access to the interior of said enclosure, the improvements being characterized in that said insulator mounting and access means comprises a series of longitudinally extending oval-shaped openings in said tubular enclosure, an integral oval-shaped flange defining each said opening, a cuboid-shaped bracket means mounted across each oval flange between opposite elongated sides thereof, each said bracket means including a square base extending radially inwardly toward the center of said enclosure, said insulator being secured to said bracket base, said cuboid-shaped bracket mounted over said oval-shaped opening defining a pair of semicircular spaces providing access for inspection to the interior of said enclosure, and located at longitudinally spaced opposite sides of said bracket means, and an oval-shaped cover releasably secured to each said oval-shaped flange and overlying said bracket means.

4,296,274

HIGH VOLTAGE BUSHING HAVING WEATHERSHED AND SURROUNDING STRESS RELIEF COLLAR

Alan H. Cookson, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 11, 1980, Ser. No. 167,501
Int. Cl.³ H01B *17/26, 17/42*
U.S. Cl. 174—142 **12 Claims**

1. A high voltage bushing comprising:

a hollow weathershed having an outside surface and a first end;

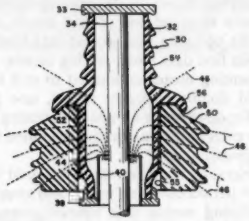
a high voltage conductor disposed within said weathershed exerting a region of high electric field stress concentration on the outside surface of said weathershed;

means contacting the electric field for outwardly directing the concentration of high electric field stress to a predeter-

mined portion of the outside surface of said weathershed; and

a dielectric collar surrounding said predetermined portion of said weathershed, said collar having adjacent the region of high electric field stress concentration, a thickness substantially greater than the thickness of said weathershed, said collar further having an outside surface which forms a portion of the outside surface of said bushing; and

means, separate from said collar, for supporting said weathershed, whereby the electric field stress concentration on the outside surface of said bushing is relieved.



4,296,275

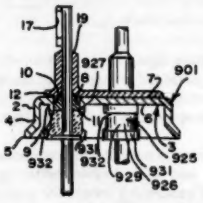
HERMETIC REFRIGERATION TERMINAL

Benjamin Bowsky, Maineville, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 9, 1980, Ser. No. 157,411

Int. Cl.³ H01B *17/26*

U.S. Cl. 174—152 GM **13 Claims**



1. In a hermetic refrigeration terminal having a cup-shaped body with a generally flat bottom and at least one opening in said bottom defined by an annular sealing lip, a current conducting pin extending through said opening and beyond said lip on both ends thereof, the inner end of said pin being on the dish side and the outer end being on the outer side of said body, and a seal bonding said pin to an inside surface of said lip, the improvement comprising a flange extending generally radially from said pin and located axially between said lip and said inner end of said pin, and a sleeve surrounding said pin and extending axially between said flange and said lip, said sleeve being at least in part larger in diameter than said opening, said sleeve being bonded at its end opposite the flange to said seal.

4,296,276

ROD-TYPE SYNTHETIC RESIN INSULATOR WITH OVERCOAT AND METAL FITTINGS

Takeshi Ishihara, Toyoake; Daisaku Goto, Konan, and Hitoshi Sugiura, Toyohashi, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

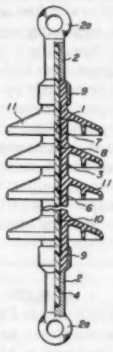
Filed Mar. 4, 1980, Ser. No. 127,038

Claims priority, application Japan, Nov. 17, 1979, 54-149317

Int. Cl.³ H01B *17/02*

U.S. Cl. 174—179 **6 Claims**

1. A synthetic resin insulator comprising a fiber-reinforced plastic rod, metal fittings which hold both ends of the fiber-reinforced plastic rod, and a seamless unitary overcoat which consists of an elastic insulating material, covers the total surface of the fiber-reinforced plastic rod located between the metal fittings and is provided at its outside with a plurality of sheds, said metal fittings having metal sleeves gastightly fixed thereto and being operative to receive both ends of the overcoat, both ends of said overcoat being sandwiched between the metal sleeve and the fiber-reinforced plastic rod and fixed and sealed in the metal sleeve by pressing the sleeve in the radial direction so as to isolate gastightly the interface between the overcoat and the fiber-reinforced plastic rod from the external atmosphere, and wherein the elongation of the outer surface of the overcoat resulting from assembly with said fiber-reinforced plastic rod and pressing of said sleeves is not higher than 2%.



4,296,277

ELECTRONIC VOICE DETECTOR

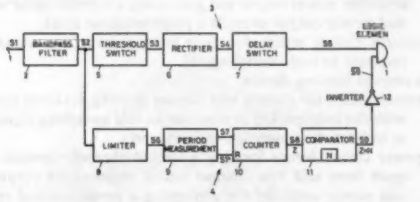
Hansruedi Daneffel, Uerikon, Switzerland, assignor to Feller AG, Horgen, Switzerland

Filed Sep. 26, 1979, Ser. No. 79,186

Claims priority, application Switzerland, Sep. 26, 1978, 10033/78

Int. Cl.³ H04M *1/64*

U.S. Cl. 179—1 VC **10 Claims**



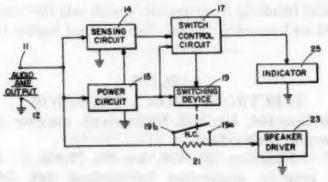
1. An electronic voice detector for use in an automatic telephone answering apparatus, said voice detector having input means for receiving audio signals from a telephone line, and output means for supplying a control signal indicating the presence of an incoming voice signal, wherein between said input means and said output means a first signal channel and a second signal channel are disposed in parallel configuration, said signal channels being commonly connected to said input means and said signal channels being connected to said output means through a logic means, said first signal channel comprising signal threshold means for generating an output signal if the signal from the input means has an amplitude exceeding a predetermined level, and signal delay means connected to the output of said threshold means for generating an output signal if said output signal from said threshold means has a duration exceeding a predetermined time interval, said second signal

channel comprising period measuring means for measuring the period of each cycle of the signal from said input means and for generating a first output signal at a first output if the period of the cycle is within a predetermined range, and a second output signal at a second output if the period of the cycle is outside said predetermined range, and counting means having a counting input, a reset input and an output, said counting and reset inputs being connected to said first and second outputs, respectively, of said period measuring means, said counting means generating an output signal for a predetermined number of consecutive output signals from said first output of said period measuring means, and being reset by an output signal from said second output of said period measuring means, said output of said delay means being connected to a first input of said logic means and said output of said counting means being connected to a second input of said logic means, said logic means being adapted to supply the control signal to said output means with the presence of an output signal from said delay means and with the simultaneous absence of an output signal from said counting means.

4,296,278
LOUDSPEAKER OVERLOAD PROTECTION CIRCUIT

Steven B. Cullison, Garden Grove, and Charles B. Slack, Costa Mesa, both of Calif., assignors to Altec Corporation, Anaheim, Calif.

Filed Jan. 5, 1979, Ser. No. 1,307
Int. Cl.[2] H04R *3/00*; H03K *5/08*
U.S. Cl. 179—1 VL **10 Claims**



1. A circuit for protecting a loudspeaker from overload by the power output of an amplifier fed thereto comprising:

sensing circuit means forming a first channel for detecting the amplifier power output and generating a control signal when said power output exceeds a predetermined level,

control circuit means for generating a switching signal in response to said control signal,

a current limiting device,

switch means for placing said current limiting device in circuit with the loudspeaker in response to said switching signal so as to limit the power fed thereto, and

power circuit means forming a second channel separate and apart from said first channel which receives the output of said power amplifier for generating a predetermined reference signal for the sensing circuit means and for providing power for the sensing circuit means and the switch means.

4,296,279
SPEECH SYNTHESIZER

John E. Stork, Malibu, Calif., assignor to Speech Technology Corporation, Santa Monica, Calif.

Filed Jan. 31, 1980, Ser. No. 117,075
Int. Cl.[3] G10L *1/00*
U.S. Cl. 179—1 SM **10 Claims**

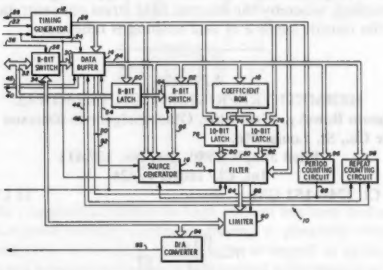
1. A speech synthesizer for developing a signal representing voiced and fricative sounds from signals representing blocks of sound describing data, the synthesizer comprising in combination:

a timing generator including means for generating a signal delineating a series of predetermined sample intervals and means for generating a signal delineating a plurality of major periods within each of said sample intervals including a first period;

double buffering means connected to said timing generator, said double buffering means including first data block storing means for asynchronously receiving the signals representing members of a block of the data, second data block storing means for developing signals representing a previously received one of said blocks of said data and means for updating said second data block storing means from said first data block storing means;

period counting means connected to said timing generator and said double buffering means, said period counting means for developing a signal delineating a series of pitch periods each having a duration specified by said previous data signals;

source generating means connected to said timing generator and said period counting means and coupled to said double buffering means, said source generating means for periodically developing an excitation signal having an amplitude specified by said previous data signals, said source generating means including means for varying the sign of said excitation signal in a quasi-random fashion,



said excitation signal being developed once during each of said pitch periods for voiced signals, said excitation signal being developed once during each of said first periods with said quasi-random varying sign for fricative sounds;

filter coefficient generating means connected to said timing generator and said double buffering means, said filter coefficient generating means for generating signals representing filter coefficients from said previous data signals;

a time multiplexed digital filter connected to said timing generator, said source generating means and said filter coefficient generating means, said filter being configurable as a two-pole filter and as a pair of cascaded single pole filters responsive to said previous data signals, said filter having filter characteristics defined by said filter coefficient signals, said filter including an output and an input connected to said source generating means during each of said first periods for receiving said excitation signal and being connected to said filter output otherwise; and

output means coupled to said filter output during each of said first periods said output coupling means for developing the sound signal.

4,296,280
WALL MOUNTED SPEAKER SYSTEM

Ronald A. Richie, 5527 S. Braeswood, Houston, Tex. 77096

Filed Mar. 17, 1980, Ser. No. 131,264
Int. Cl.[3] H04R *1/02*
U.S. Cl. 179—1 E **12 Claims**

1. A high-fidelity speaker arrangement suitable for mounting in a wall structure comprising:

(a) a bass reflex speaker enclosure having,

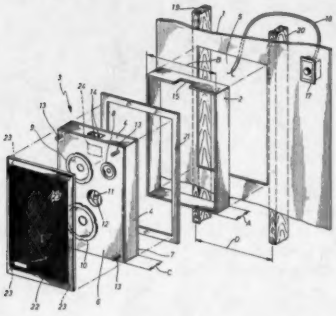
(i) a plurality of speakers of varying frequency response characteristics to produce the high-fidelity sound,

(ii) a cross-over network for band pass filtering the audio electrical signal to the speakers whereby each speaker

of given frequency response substantially receives only those frequencies of the signal that are within its response range, the depth dimension of said enclosure no greater than the nominal width of a standard wall stud, and

(iii) an acoustic sound absorber positioned to the rear of said speakers, for reducing the amount of sound reflected from the rear of said enclosure;

(b) a removable cover grille for covering the said speaker enclosure;



(c) a mounting assembly adapted for mounting between adjacent wall studs and secured to at least one of the wall studs, for receiving said speaker enclosure therein, said assembly having a depth dimension substantially equal to the depth of said speaker enclosure and a width dimension substantially equal to the nominal inside spacing between the adjacent wall studs for a standard stud spacing; and

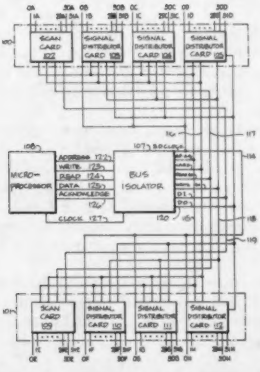
(d) a trim frame mounted to the exterior surface of the wall, for covering said mounting assembly, said removable cover grille fitting inside said frame thereby making the exterior surface of the wall mounted speaker arrangement appear to be a part of the surface of the wall.

4,296,281

STATIC, SOLID STATE ORIGINATING REGISTER COMPATIBLE WITH AN ELECTROMECHANICAL TELEPHONE CROSS-BAR SWITCHING SYSTEM

Rajasekaran Udayasekaran, Mississauga, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 28, 1980, Ser. No. 115,906
Int. Cl.³ H04Q *3/54*
U.S. Cl. 179—18 EB **9 Claims**



1. A static, solid-state originating register apparatus for use with an electromechanical telephone cross-bar switching system, said originating register apparatus comprising:

a plurality of static, solid-state scan networks responsive to an equal plurality of scan points, in a one-to-one relationship, for monitoring the status of said scan points;

a plurality of static, solid-state signal distributor networks for activating associated equipment in said switching system;

a microprocessor for controlling the operation of both said scan networks and said signal distributor networks; and

an isolator means for interfacing said microprocessor with both said scan networks and said signal distributor networks wherein said isolator means comprises:

means for changing the voltage levels of at least some address signals, originating from said microprocessor, to voltage levels suitable for use with both said signal distributor networks and said scan networks;

logic means, for providing command signals to read and to write, based both upon the logic states of a predetermined portion of the address signals, and upon the read and write signals generated by said microprocessor;

delay means, responsive to output signals of said logic means, for selectively delaying the occurrence of a read signal, a write signal and a signal distributor clock signal so as to provide a proper timing sequence for appropriate operations;

means, for changing the voltage levels of signals eminated from said delay means, to voltage levels suitable for use with both said scan networks and said signal distributor networks; and

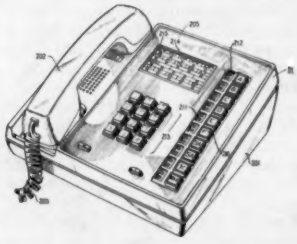
a data link interface means for interfacing bi-directional data transmitted to or from said microprocessor, on a bi-directional data link, both with the data received from said scan networks, on a uni-directional data link, and with the data transmitted to said signal distributor networks, on a uni-directional data link.

4,296,282

INCOMING CALL IDENTIFICATION ARRANGEMENT

Joseph T. O'Neil, Middletown; Thomas M. Quinn, Little Silver, and Tse L. Wang, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 30, 1980, Ser. No. 164,358
Int. Cl.³ H04Q *5/20*
U.S. Cl. 179—99 LS **3 Claims**



1. In a communication system having a plurality of multibutton stations each having capability of communicating with other stations over communication lines internal to the system wherein each button of each multibutton station is nonlocking and operable to establish communication connections to said station, said system comprising

means (**16-1**; FIG. **8**; FIG. **12**, SADT-**1**, SL-LSO) for providing visual signals at each communication control button of each station (**S1**, **S2**, **S3**) as an indication that a calling connection is incoming to the line controlled by said button at said station,

one of said buttons (**210B**) at a first station (**S3**) designated as a call coverage button operable to enable a communica-

tion connection between said first station (S3) and a first line on which a calling connection is being directed to a second station (S2),

a visual display field (214; FIGS. 3, 4 and 5; FIG. 14, RNG-CAL) at said first station operable when a call is directed to said first station for indicating the identity of the calling station (S1), said system characterized in that there is also provided determining means (FIGS. 3, 2, 7, 18 and 29, FIG. 10) for use on each incoming call to said first station (S3) to identify calls directed to said call coverage button (210B), and

means (FIG. 7; FIG. 9; FIG. 14; SL-ILJ) responsive to an identified call directed to said call coverage button (210B) for inhibiting said visual indication of said calling station (S1) and for substituting therefor on said visual display field an indication of the original called station (S2).

4,296,283

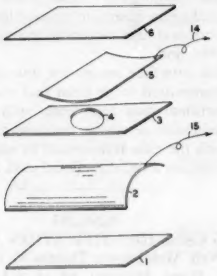
NORMALLY CLOSED WAFER SWITCH

Robert H. Koenig, Huntington Hills, and Victor D'Angelo, Port Washington, both of N.Y., assignors to Tapeswitch Corporation of America, Farmingdale, N.Y.

Filed May 17, 1979, Ser. No. 39,807

Int. Cl.³ H01H *1/14*

U.S. Cl. 200—16 D **4 Claims**



1. A wafer switch which is normally closed in relaxed position but which opens when squeezed comprising:

a lower stiff plate,

a first curved conductive contact member having a longitudinal axis of curvature and mounted on the lower plate with the curvature extending in the upward direction,

an insulating plate mounted on the first curved conductive contact member, the insulating plate having a central aperture,

a second curved conductive contact member having a longitudinal axis of curvature and mounted on the insulating plate and having its curvature extending in the downward direction, said longitudinal axes of the first and second curved contact members being at right angles to each other,

the first and second conductive contact members being in contact through the aperture when they are in relaxed position,

an upper stiff plate mounted on the second curved contact member whereby when the upper and lower stiff plates are squeezed together the contact is broken.

4,296,284

FLEXIBLE SHIELD FOR HIGH VOLTAGE DISCONNECT SWITCH

Donald L. Lott, Portland, Oreg., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Dec. 26, 1979, Ser. No. 106,720

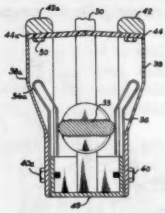
Int. Cl.³ H01H *31/00, 9/00*

U.S. Cl. 200—48 R **10 Claims**

1. Ice shielding means for an outdoor, high voltage disconnect switch assembly having interengaging moveable and stationary members, comprising:

rigid support means coupled to the stationary portion of the switch and extending generally vertically therefrom;

flexible shielding means having one side thereof fixedly coupled to said support means and aside opposite said one side free and unsupported so as to extend above the sta-



tionary portion of the switch and in the path of the moveable portion thereof;

whereby movement of the moveable portion of the switch pursuant to disengagement of the switch members temporary elastically deforms the shielding means.

4,296,285

HIGH-VOLTAGE, BLAST-ACTUATED POWER SWITCH HAVING FIELD ELECTRODES

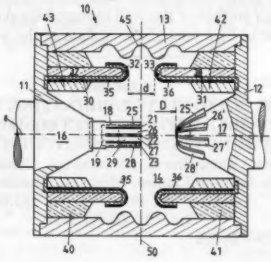
Ernst Lang, Würenlingen, and Lutz Niemeyer, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jan. 9, 1980, Ser. No. 110,793

Claims priority, application Switzerland, Jan. 11, 1979, 243/79

Int. Cl.³ H01H *39/00*

U.S. Cl. 200—61.08 **8 Claims**



1. A high voltage, blast-actuated power switch having a hollow switch casing and having first and second external electrical connections, said first and second external connections being electrically insulated from each other, said switch comprising:

bridge conductor means included within said switch casing for electrically connecting said first external connection to said second external connection, said bridge conductor means having first and second bridge conductor elements electrically connected to said first and second external connections, respectively, and said first and second bridge conductor elements being separatably connected to each other;

means for physically separating said first bridge conductor element from said second bridge conductor element by a first distance so as to electrically disconnect said first external connection from said second external connection; and

first and second field electrodes included within said switch casing, said first and second field electrodes being electri-

cally connected to said first and second external connections, respectively, and said first and second field electrodes being separated by a second distance;

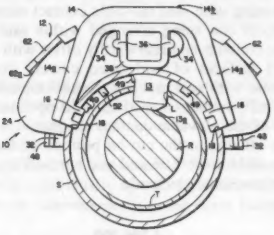
wherein said second distance is less than said first distance.

4,296,286

SELF-REFERENCING POSITION SWITCH

Warren N. Richardson, Mashpee, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 16, 1979, Ser. No. 95,042
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—61.54 **19 Claims**



1. A self-referencing position switch adapted to be responsive to the position of a movable member relative to a second member, the movable member being movable over a course between a location at one end of the course and a selected location along the course, said switch comprising

A. a switch housing,

B. a switch actuator projecting from the housing for engagement by one of said members and movable by that member relative to the housing along a track to selectively open or close the switch when positioned at a determined location along the track from one end thereof,

C. means for mounting the housing to the other of said members so that the track extends in the same general direction as the course,

D. means for movably connecting the housing to the mounting means so that the two can move relative to one another along a path which extends in the same general direction as said course, and

E. means for adjustably maintaining the relative positions of the housing and mounting means along said path so that if the determined location is positioned beyond the selected location from said one course end, by moving said one member to said one course end, said switch actuator will be moved to said one track end and shift the housing relative to the mounting means by the amount required to align said determined track location with the selected course location.

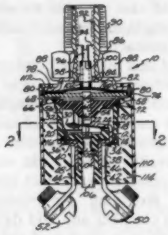
4,296,287

WEATHERPROOFED CONDITION RESPONSIVE SWITCH

Henry J. Boulanger, Cumberland, R.I.; Victor Lowell, North Attleboro, and Elliot Whipple, Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 23, 1979, Ser. No. 97,018
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 P **13 Claims**

11. Condition responsive appartus comprising a generally cup shaped base having a bottom wall and a side wall depending therefrom, and forming a chamber therein, the side wall terminating at an open end, a motion transfer pin guide having a bore therethrough received at the open end of the base, a diaphragm assembly comprising a metallic annular diaphragm support plate disposed on the guide, a metallic diaphragm disposed on top of the support plate and a cup shaped metallic housing disposed on top of the diaphragm, the diaphragm support, diaphragm and housing welded together along a common, continuous outer peripheral margin, a motion transfer pin slidingly received in the guide and having two opposite ends, one end adapted to engage the diaphragm, a stationary electrical contact mounted in the base, a movable contact arm mounted in the base and adapted to move into and out of engagement with the stationary contact, the other end of the motion transfer pin adapted to engage the movable contact



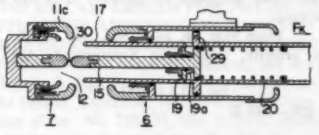
arm, terminal receiving apertures formed in a wall of the base, electrical terminal means received in the apertures and connected to the stationary contact and movable contact arm, an orifice extending through the bottom wall of the base and pressure equalization means received in and occupying essentially all of the cross sectional area of the orifice whereby changes in pressure in an ambient in which the apparatus is disposed and the pressure within the chamber are able to equalize.

4,296,288

GAS INSULATED DISCONNECTING SWITCHES

Satoru Yanabu, Machida; Hitoshi Mizoguchi, and Naoaki Simogawara, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 24, 1979, Ser. No. 87,655
Claims priority, application Japan, Oct. 30, 1978, 53-132593
Int. Cl.³ H01H *33/12, 33/88*
U.S. Cl. 200—146 R **3 Claims**



1. A gas insulated disconnecting switch comprising:

(A) a stationary contact assembly including:

a substantially rod-shaped stationary arc electrode, and

a stationary conductive contact, and

(B) a movable contact assembly provided to confront said stationary contact assembly and including:

a stationary cylinder having an annular end plate extending inwardly from said stationary cylinder,

a cylindrical movable conductive contact coaxial with said stationary cylinder and having a piston extending outwardly from said movable conductive contact at a position farther from said stationary contact assembly than said end plate of said stationary cylinder, said piston slidably and gastightly engaging the inner surface of said stationary cylinder,

said end plate of said stationary cylinder slidably and gas-tightly engaging the outer surface of said movable conductive contact to form a compression chamber between said end plate and said piston and between said

stationary cylinder and said movable conductive contact, and

said movable conductive contact further having an annular stopper extending inwardly from said movable conductive contact,

a substantially rod-shaped movable arc electrode coaxial with said stationary cylinder and having a piston extending outwardly from said movable arc electrode at a position farther from said stationary contact assembly than said stopper of said movable conductive contact, said piston of said movable arc electrode slidably and gas-tightly engaging the inner surface of said movable conductive contact,

said stopper of said movable conductive contact slidably and gas-tightly engaging the outer surface of said movable arc electrode to form a damping chamber between said stopper and said piston of said movable arc electrode and between said movable conductive contact and said movable arc electrode, and

said movable conductive contact being provided with a perforation providing communication between said compression chamber and said damping chamber, said perforation being so positioned and sized that it extends, when said movable conductive contact is in engagement with said stationary conductive contact, over both sides of said end plate to provide communication between the two chambers and the exterior of the chambers, and,

a spring engaging at one end with said movable conductive contact and at the other end with said movable arc electrode in such a manner that when said movable conductive contact is moved toward said stationary conductive contact said spring urges said movable arc electrode toward the stationary arc electrode,

said stopper having a projection projecting toward said piston of said movable arc electrode to engage with and push said piston of said movable arc electrode when said movable conductive contact is separated from said stationary conductive contact.

4,296,289

ELECTRIC GAS-BLAST SWITCH

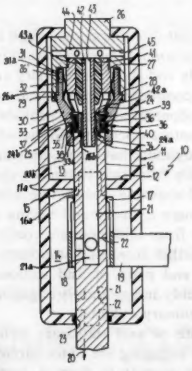
Hans-Rudolf Wüthrich, Oberentfelden; Peter Krebs, Hirschtal; Hubert Spiegel, Oberentfelden, and Franz Eicher, Aarau, all of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Mar. 26, 1979, Ser. No. 24,465

Claims priority, application Switzerland, Apr. 19, 1978, 4176/78

Int. Cl.³ H01H *33/70*

U.S. Cl. 200—148 R **12 Claims**



1. An electrical gas-blast switch comprising:

a fixed set of contacts;

a movable, substantially tubular-shaped contact element which can be brought into and out of engagement with said fixed set of contacts;

said fixed set of contacts comprising:

a rim of rated current contacts which in a cut-on position of the switch engages about said movable contact element;

a burn-off rim electrically connected with the rated current contacts;

an intermediate electrode surrounded by said rim of rated current contacts but electrically insulated from the latter;

said rim of rated current contacts having contact surfaces cooperating with said movable contact element;

said burn-off rim being arranged within said rim of rated current contacts and rearwardly offset with respect to the contact surfaces of said rated current contacts which cooperate with said movable contact element;

a substantially tubular-shaped burn-off tip mounted at an end region of the movable contact element;

said burn-off rim, in the cut-on position of the switch, surrounds said burn-off tip and said burn-off tip engages with said intermediate electrode.

4,296,290

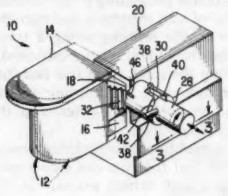
SAFETY LOCK-ON MOTOR CONTROL

David G. Peot, Easley, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 16, 1980, Ser. No. 112,681

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—325 **7 Claims**



1. In a trigger control for motor tools, or the like, incorporating a lock-on button on the side thereof; blocking means for blocking the lock-on button in a first rotational position of said button preventing an inadvertent depression but which enables the lock-on button to be rotated to a second rotational position and then depressed to provide a lock-on mode of operation which is easy to effectuate intentionally and having biasing means for automatically rotating said button when released from said second rotational position to said first rotational position so that such lock-on action is yet difficult to effectuate accidentally.

4,296,291

ELEVATOR CONTROL ADAPTOR FOR HANDICAPPED USERS

Lester E. Johnson, Rte. #2, Box 40, Glyndon, Minn. 56547

Filed Jan. 25, 1980, Ser. No. 115,487

Int. Cl.³ H01H *3/20*

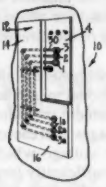
U.S. Cl. 200—331 **16 Claims**

1. A method of making both the floor buttons and the car control buttons of a pre-installed self-service elevator system usable by persons unable to easily reach them, which comprises:

(a) establishing generally adjacent to each set of pre-installed floor and car control buttons an array of auxiliary buttons equal in number to the buttons in the adjacent set, wherein the auxiliary buttons in each array are located at a height

which is easily reached by the persons who are unable to easily reach the floor and car control buttons;

(b) operatively connecting each of the auxiliary buttons in each array to a corresponding one of the buttons in the adjacent set by mechanically linking the auxiliary buttons to the corresponding buttons in the adjacent set such that



an inward actuating movement on one of the auxiliary buttons translates through the mechanical linkage to an inwardly actuating movement to its corresponding button in the adjacent set; and

(c) allowing all of the pre-installed floor and car control buttons to be individually operable in a normal manner by other persons who can easily reach these buttons.

4,296,292

VARIABLE ELECTROMECHANICAL DEVICE

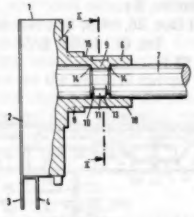
Christian Schuberth, Bad Neustadt, and Rudolf Hartmann, Salz, both of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 94,891

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850835

Int. Cl.³ H01H *3/08;* **H01C** *10/00*

U.S. Cl. 200—336 **7 Claims**



1. A variable electromechanical device, comprising

(a) a housing having a bore;

(b) an actuation shaft rotatably mounted in the bore and having an annular groove;

(c) a portion of the housing being displaced by stamping to extend into the annular groove of the shaft for preventing axial movement of the shaft within the bore;

(d) at least one projection formed on the shaft within the annular groove to cooperate with said displaced portion for limiting the rotation of the shaft relative to the housing;

(e) a high-viscosity liquid filling said annular groove, and

(f) liquid passage means associated with said projection to allow said liquid to pass from one side of the projection to the other side thereof when the shaft is rotated.

4,296,293

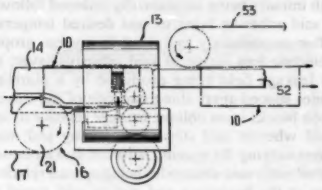
PROGRESSIVE WELDING AND FORGING OF OVERLAPPED SEAMS IN TUBULAR BODIES

Howard L. Gerber, Park Forest, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Feb. 25, 1980, Ser. No. 124,414

Int. Cl.³ B23K *13/02;* **H05B** *6/40*

U.S. Cl. 219—8.5 **30 Claims**



1. A method of forming a tubular body with a welded longitudinal seam, said method comprising the steps of providing an unseamed tubular body, axially advancing the tubular body while guiding free edges of the body into overlapped relation, introducing electrical energy into the tubular body to heat the overlapped body free edges to a bonding temperature, lightly urging the heated free edges into bonding contact substantially without deformation of the free edges, and then forging the bonded still heated overlapped edges to effect a complete welding of the overlapped edges and materially reducing the thickness of a joint between the overlapped edges.

18. Apparatus for forming a welded side seam in a sheet metal tubular member, said apparatus comprising means for moving a rounded tubular member along a predetermined path with edge portions of the members in circumferentially overlapped relation, heating means disposed along said path for heating the edge portions to a welding temperature, pressing means disposed along said path adjacent said heating means for lightly urging the heated edge portions into bonded engagement, and forge means downstream of said pressing means for forging the bonded overlapped edge portions to effect a complete welding of the overlapped edge portions while materially reducing the thickness thereof.

4,296,294

METHOD AND APPARATUS FOR DRYING AND SETTING THE ADHESIVE ON BOOKS BY VAPORIZATION OF WATER USING RF ENERGY

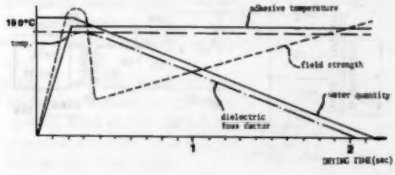
Alexander Beckert, Wien-Osterreich, Austria, and Karl-Heinz Knobbe, Ellerbeck, Fed. Rep. of Germany, assignors to Reinhard Mohn GmbH, Gutersloh, Fed. Rep. of Germany

Continuation of Ser. No. 728,576, Oct. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 581,616, May 29, 1975, Pat. No. 4,014,732. This application Nov. 13, 1978, Ser. No. 960,269

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1974, 2426704; Nov. 29, 1975, 2553816

Int. Cl.³ H05B *6/54;* **B32B** *19/02*

U.S. Cl. 219—10.41 **7 Claims**



1. An improved method for drying and setting an adhesive layer applied to the backs of book blocks by passing the book blocks by means of clamps along a travel path through a high

frequency leakage field to vaporize the water in the adhesive, the improvement comprising the steps of:

subjecting the adhesive layer on the back of said book blocks to a high frequency leakage field of high strength to heat the adhesive layer to a desired vaporization and drying temperature;

maintaining said desired temperature until said adhesive layer is completely dried and set by varying the strength of said high frequency leakage field along said travel path, said field strength initially being substantially reduced following heating of said adhesive layer to said desired temperature and thereafter continuously increased in inverse proportion to the dielectric loss factor of said adhesive layer, said high energy leakage field being produced by a plurality of RF electrodes spaced-apart along one side of the travel path of said book blocks in an oblique manner relative to said travel path and wherein said step of subjecting and maintaining comprises varying the spacing between said electrodes along said travel path, said electrodes being spaced relatively close together at the beginning and end of said travel path and being spaced further apart in the center range of said travel path, with the spacing between said electrodes decreasing from said center range to the end of said travel path, and wherein adjacent electrodes are fed with 180° phase displaced voltages so that the voltage difference between adjacent electrodes is larger than between an electrode and a clamp.

4,296,295

INDUCTION HEATING COIL

Mitsuyuki Kiuchi, Minoo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 25, 1980, Ser. No. 133,685
Claims priority, application Japan, Apr. 4, 1979, 54/44205[U]
Int. Cl.³ H05B *5/04*
U.S. Cl. 219—10.49 R **4 Claims**

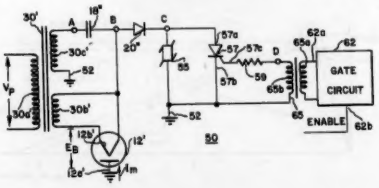
1. A flat spiral wound induction heating coil of inner and outer pitch for a cooking appliance of the induction heating type which comprises a coil winding of litz wire having inner and outer turns, the outer turns being directly adjacent with each other and having a substantially uniform pitch, and a strip of electrically insulating material which is wound along between and adjacent to only said inner turns of said coil winding of litz wire so as to provide a comparatively larger, substantially uniform winding pitch for said inner turns of litz wire than the pitch of said outer turns thereof and thereby providing a uniform temperature distribution across the bottom of the cooking appliance.

4,296,296

CONTROLLABLE-DUTY-CYCLE POWER SUPPLY FOR MICROWAVE OVEN MAGNETRON AND THE LIKE

Charles W. Eichelberger; Rudolph A. Dehn, both of Schenectady, and Robert J. Wojnarowski, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 13, 1979, Ser. No. 66,300
Int. Cl.³ H05B *6/66*
U.S. Cl. 219—10.55 B **9 Claims**



1. A controllable-duty-cycle power supply for connection between a sinusoidal power source and a load consuming appreciable amounts of power only if a minimum voltage applied thereto is exceeded, comprising:

a power transformer having a primary winding connected to said source and a high-voltage secondary winding having first and second ends;

a capacitance element connected in electrical series connection with said secondary winding first end and said load;

means connected to the junction between said capacitance element and said load for allowing unidirectional flow of current in only one of the directions toward and from said junction;

a non-linear resistance element in electrical series connection with said unidirectional means across said load; said non-linear resistance element providing a relatively high resistance for all voltages thereacross less than a predetermined breakdown voltage which is less than said minimum voltage and sufficiently large to prevent application of said minimum voltage to said load, and providing a relatively low resistance when the voltage thereacross exceeds said breakdown voltage;

a gateable element in electrical parallel connection with said non-linear resistance element, said gateable element having a breakdown voltage greater than said non-linear resistance element and less than said minimum voltage and being controllable to conductive and nonconductive conditions respectively to cause the voltage across said load to be respectively at least said minimum voltage and less than said minimum voltage and said load to be respectively power-consuming and non-power-consuming responsive respectively to first and second amplitudes of a controlling signal; and

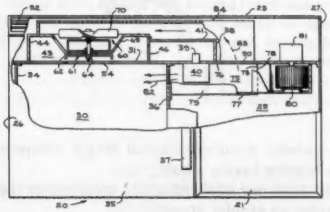
means for providing said controlling signal of said first amplitude at a frequency at least two orders of magnitude higher than the frequency, at all phase angle relationships of each cycle, of said sinusoidal power source and with a controllable ratio of the time interval during which said relatively high frequency control signal is present to the entire time interval between successive intervals of control signal.

4,296,297

DRIVE ARRANGEMENT FOR MICROWAVE OVEN MODE STIRRER

Matthew S. Miller, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 26, 1979, Ser. No. 106,649
Int. Cl.³ H05B *6/74*
U.S. Cl. 219—10.55 F **6 Claims**



1. A microwave energy stirrer assembly for a microwave oven, said stirrer including stirrer blades mounted for rotational movement in the path of microwave energy into said oven, a vertical mounting shaft, said blades mounted adjacent the lower end of said shaft, a drive fan carried by said shaft adjacent the end remote from said stirrer blades, said stirrer blades adapted when rotated to change the microwave energy field pattern in said oven, air channeling means for directing a flow of air into contact with said drive fan to rotate said fan and consequently said shaft and mode stirrer blades, and a

cylindrical bearing for supporting said assembly, said drive fan comprising a plurality of blades having surfaces facing said flow of air, said surfaces being shaped to lift said assembly axially from said bearing during rotation.

4,296,298

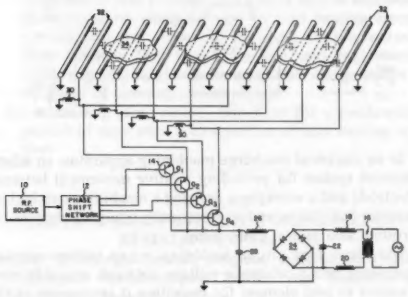
DIELECTRIC COOKING APPARATUS

George H. MacMaster, Lexington, and Kenneth W. Dudley, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 914,694, Jun. 12, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,004

Int. Cl.³ H05B *6/54*

U.S. Cl. 219—10.81 **3 Claims**



1. A dielectric heating oven comprising:
an enclosure;
a source of RF energy;
means for substantially terminating both ends of electric fields in a plane, said terminating means comprising a plurality of at least four elongated parallel electrodes positioned in said plane in said enclosure and spaced apart substantially less than a free space wavelength of said energy;
means for electrically grounding alternate electrodes of said plurality;
means for coupling said RF energy from said source to the remaining ungrounded electrodes of said plurality for cooking food positioned adjacent to said plane, said coupling means comprising means for selecting between deep or shallow cooking effects in said food, said selecting means including means for selectively varying the phase difference between the phase of energy coupled to one of said ungrounded electrodes and the phase of energy coupled to a second of said ungrounded electrodes; and
said phase difference is selectable between approximately 90°, 180° and 270° out of phase.

4,296,299

APPARATUS FOR THAWING FROZEN FOOD IN A REFRIGERATION APPLIANCE

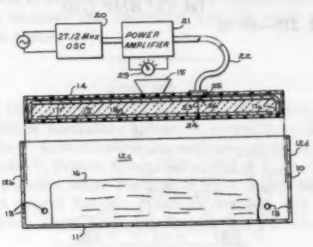
Richard L. Stottmann, Louisville, and Peter H. Smith, Anchorage, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 31, 1979, Ser. No. 108,755

Int. Cl.³ H05B *6/46*

U.S. Cl. 219—10.81 **5 Claims**

1. For use in a refrigeration appliance, apparatus for thawing a frozen food load comprising:
a food thawing enclosure including top, bottom and side walls comprised of electromagnetic radiation shielding material and adapted to be positioned within and in good thermal communication with the low temperature atmosphere of the refrigeration appliance, said enclosure including first and second electrodes defining a food thawing zone therebetween;
means for moving at least one of said electrodes to permit removable placement of the food load in the thawing zone with both electrodes in close physical proximity to the food loads during the thawing process;
and means for supplying high frequency electromagnetic energy to said electrodes to thaw the food,



whereby the food load can be thawed and subsequently maintained at the food preservation temperature of the refrigeration appliance.

4,296,300

METHOD AND DEVICE FOR WELDING PROTECTED METAL PARTS

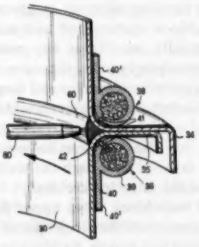
Augusto Bottiglia, Milan, Italy, assignor to Sio-Societa per l'Industria Dell'Ossigenc e di Altri Gas, Milan, Italy

Filed Dec. 19, 1978, Ser. No. 971,105

Claims priority, application Italy, Dec. 23, 1977, 31263 A/77

Int. Cl.³ B23K *9/23*

U.S. Cl. 219—61.7 **9 Claims**



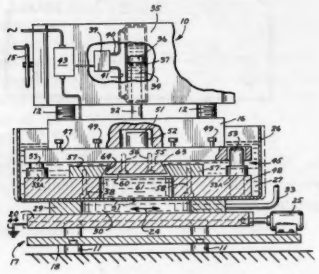
1. A method for welding metal protected by a coating of a material which volatilizes at a temperature less than the welding or brazing temperature of the metal, the method comprising, in combination:
forming a weld on the metal through the use of an electric arc;
cooling a selected localized portion of the coating in the immediate vicinity of the weld by applying a cryogenic cooling fluid to the coating, to maintain said coating at a temperature below its volatization temperature during the formation of the weld;
detecting the temperature of the coating portion during the formation of the weld; and
adjusting the cooling effect of the cryogenic fluid in accordance with the detected temperature.

4,296,301

DIE FORMING METHOD AND MACHINE

Romain H. Johnson, 925 - 6th St. SE., Minneapolis, Minn. 55414

Continuation of Ser. No. 772,433, Feb. 28, 1977, abandoned. This application Sep. 12, 1978, Ser. No. 941,385
Int. Cl.[3] B23P 1/00
U.S. Cl. 219—69 M 15 Claims



1. The method of forming a complete die from a blank and a die set having an upper shoe, a lower shoe, and guide means mounting the upper shoe on the lower shoe whereby the upper shoe can be moved toward and away from the lower shoe in a linear direction comprising the steps of:

severing a single blank to form a rough-cut female die block having an opening therethrough whereby the portion of the blank defined within the opening forms a rough-cut male die punch block complementary thereto and peripherally spaced from the female block when centered therein,

said severing forming adjacent rough-cut side walls on said female die block opening and said male punch block that are substantially parallel at any point therearound and tapered convergingly in the direction of intended die draft to define respectively smaller and larger openings on said female block and end surfaces on said male block on either side thereof with the larger end surface of said male block greater in size than the smaller opening of the female block, said taper of the rough-cut walls being greater than the taper of the intended die draft,

securing said male block to an upper die set shoe with the larger end surface of the block spaced downwardly therefrom, securing said female die block to a lower die set shoe with the smaller block opening spaced upwardly therefrom and said female block in surrounding relation to said male block,

aligning said die set shoes with said guide means for vertical relative movement in said linear direction so as to center the male block within the female block opening and with said male and female block walls in laterally spaced relation,

securing said upper die set shoe to an extractor, securing said lower die shoe to a bed, and,

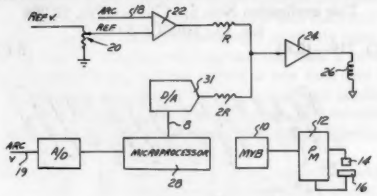
moving the male punch block and female die block relative to each other in a direction in opposition to the taper of the side walls of the punch block and die opening while simultaneously effecting material-removing erosion between the male die punch block and the female die block to generate preselected die clearance and die draft.

4,296,302

ADAPTIVE CONTROL OF GAP VOLTAGE AND POWER TO CONTROL SERVO OPERATION OF AN ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Aug. 21, 1979, Ser. No. 68,329
Int. Cl.[3] B23P 1/02
U.S. Cl. 219—69 G 7 Claims



1. In an electrical discharge machining apparatus, an adaptive control system for providing relative movement between an electrode and a workpiece defining a machining gap including a servo feed motor and an electrically operated element for controlling said motor, comprising:

a first servo feed circuit including a gap voltage sensing network and a reference voltage network operably connected to said element for operating it responsive to the difference of voltage therebetween;

a second servo feed circuit including a second network for sensing gap voltage;

means for converting the output of said second network for sensing gap voltage to a first digital value;

means for comparing such first digital value to a predetermined and prestored digital value; and representative of optimum machining level;

means for providing an analog output responsive to difference between said digital values and providing a second control output to modify the operation of said element and thus of said servo feed motor; and

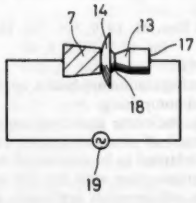
a summing network operatively connected to the outputs of said first and second servo feed circuits for combining them before passing them to said electrically operated element.

4,296,303

METHOD FOR MAKING INTERCELL CONNECTIONS IN MULTI-CELL STORAGE BATTERY

Kensaku Tsuchida, Kamakura, and Shinji Karasawa, Chigasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 26, 1979, Ser. No. 60,873
Claims priority, application Japan, Oct. 6, 1977, 52-120576
Int. Cl.[3] B23K 11/14
U.S. Cl. 219—78.13 14 Claims



1. In a method for making an intercell connection in a multicell storage battery including, in each unit cell separated by at

least a partition wall having an opening for said intercell connection, a pair of connectors integral with straps electrically conductive to electrode assemblies of one polarity and of the other polarity, wherein one of the connectors has a projection formed integral therewith and extending therefrom passing through said opening, and the other of the connectors has an aperture with an axis extending in the longitudinal direction of said projection to accept said projection extending through said opening, the method comprising the steps of:

(a) positioning said one and the other connectors of neighboring unit cells in contact with opposite sides of said partition wall so that said projection passes through said opening into said aperture to form a fit joint inbetween,

(b) causing said fit joint to be fused together by supplying said fit joint with heat sufficient for welding said projection with said aperture by applying an outside heating electrode to said fit joint with a back face of said other of the connectors being pressed by said heating electrode toward said connector and causing a heating current to flow between said projection and said heat electrode while pressing said connectors against said partition wall by a pair of pressing members, and

(c) continuing said pressing condition for a predetermined period of time after a completion of said heating operation.

4,296,304

ELECTRODE DISPLACEMENT MONITORING IN RESISTANCE WELDING

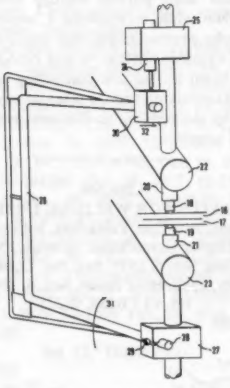
Jacques Defourny, Herstal, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Sep. 19, 1978, Ser. No. 943,798

Claims priority, application Luxembourg, Sep. 20, 1977, 78152

Int. Cl.³ B23K *11/10*

U.S. Cl. 219—86.41 **3 Claims**



1. In combination with a resistance welding machine comprising a main welding machine frame structure supporting a pair of first and second electrodes having a common alignment axis, apparatus for monitoring the operation of the welding machine, the apparatus comprising:

a single sensor for measuring displacement of the electrodes relative to each other during welding, the sensor having an axis along which the said displacement is measured, the said axis of the sensor and said common alignment axis of the electrodes being mutually parallel, the distance between the said axes being sufficiently small to render negligible any inadvertent small variation in parallelism between said sensor axis and said common alignment axis, wherein said single sensor is fixed to the first electrode,

the apparatus further comprising a second frame member, separate from said main frame structure and having two transverse elements, which are substantially perpendicular to the said alignment axis, and a longitudinal element interconnecting the transverse elements, one of the transverse elements being fixed to the second electrode, the other of the transverse elements being connected to the sensor, the longitudinal element being spaced from the electrodes by a distance which is only slightly less than the spacing between the electrodes and the main welding machine frame.

4,296,305

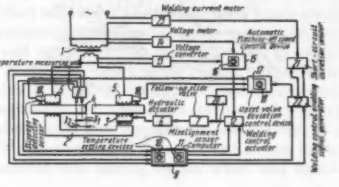
MACHINE FOR CONTINUOUS FLASH BUTT WELDING

Viktor S. Lifshits, Kavkazsky bulvar, 21, korpus 2, kv. 41, Moscow; Vadim P. Krivonos, Krasnoarmeiskaya ulitsa, 45, kv. 92, Kiev; Nikolai V. Podola, ulitsa Pushkinskaya, 8, kv. 12, Kiev; Boris L. Grabchev, ulitsa Tupoleva, 5, kv. 4, Kiev; Vladimir R. Andrianov, proezd Zarevoi, 3, kv. 19, Moscow, and Rifkhat M. Shakirov, ulitsa Khudaiberdina, 1, kv. 16, Ufa, all of U.S.S.R.

Filed Apr. 10, 1979, Ser. No. 28,876

Int. Cl.³ B23K *11/04*

U.S. Cl. 219—101 **5 Claims**



1. A machine for continuous flash butt welding of parts, comprising:

a welding transformer with a primary winding and a secondary winding;

a frame;

a movable clamping jaw and a stationary clamping jaw mounted on said frame for clamping workpieces mounted thereon;

a follow-up slide valve including a valve body and a rod;

hydraulic actuator means for displacing said movable clamping jaw and governed by said follow-up slide valve;

an automatic flashing-off speed control device;

a computer having an output, and including an automatic beginning-of-upset control device and an automatic upset value control device having an input, said computer, said automatic beginning-of-upset control device and said automatic upset value control device being incorporated in one unit;

a welding current meter forming one element of a welding circuit, and having an input connected to said primary winding of the welding transformer, and having an output;

first sensor means connected to the output of said welding current meter for detecting a short-circuit duration in the welding circuit;

control means having an output for controlling an upset value deviation, and provided with second sensor means for detecting slippage of said workpieces mounted on and welded in said clamping jaws;

third sensor means mounted on said follow-up slide valve for indicating misalignment of said rod of said follow-up slide valve relative to said valve body, and having an input and an output, said output of the third sensor means being connected to the input of said control means;

a welding control enabling signal generator having an input and outputs, said input of the welding control enabling signal generator being connected to the output of said computer, said outputs of the welding control enabling

signal generator being connected to said first sensor means for detecting short-circuit duration in the welding circuit and to said control means; and

actuators of said automatic flashing-off speed, beginning-of-upset and upset value control devices for controlling the flashing-off speed, beginning of upset operation, and upset value, respectively, being combined in a further single unit.

4,296,306

METHOD OF WELDING CORRUGATED METALLIC MATERIALS

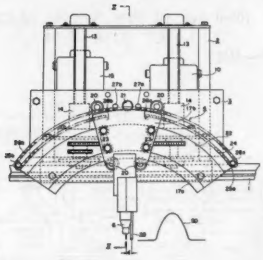
Hirokazu Nomura, and Tadashi Fujioka, both of Tsu, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 75,165

Claims priority, application Japan, Sep. 29, 1978, 53-119264

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—124.34 **1 Claim**



1. A method for welding corrugated metallic materials wherein a lifting block is vertically movably mounted on a welding apparatus proper which is movable in a horizontal direction on a track extending along a weld line and a rotating block carrying a welding torch is mounted on said lifting block, comprising the steps of:

mounting said welding torch to said rotating block by way of an arc length controlling drive block; comparing a change in an arc voltage with an arc length setting voltage; controlling an arc length control motor mounted on said arc length controlling drive block in response to a difference signal resulting from said comparison so as to maintain the arc length constant; controlling a lifting block drive motor in accordance with the rotational angle of said arc length control motor so as to bring the tip position of said welding torch into coincidence with the center of rotation of said rotating block; controlling a rotating block drive motor in response to signals from an obliquity detector disposed integrally with said torch and ahead thereof with respect to the direction of welding so as to maintain said torch at an angle corresponding to the oblique angle of the material to be welded; and controlling a welding apparatus proper traversing motor in response to a signal corresponding to said torch angle so as to maintain the welding speed constant.

4,296,307

MANUFACTURING METHOD OF THE VALVE DISK OF SPRING LOADED SAFETY VALVES

Noboru Hagihara, Nishinomiya, Japan, assignor to TOA Valve Co. Ltd., Toribayashi Amagasaki, Japan

Filed Oct. 9, 1979, Ser. No. 82,909

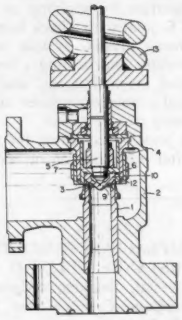
Claims priority, application Japan, Oct. 9, 1978, 53-124440

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 ED **4 Claims**

1. A method of manufacturing a valve disk for a spring-loaded safety valve, said valve disk comprising a cup-shaped center portion and a cylinder portion annularly fitted thereto, said center portion having a central longitudinal axis, a lower end, an outer periphery, a stepped annular recess about said lower end, and an annular protrusion axially-extending from said lower end and spaced radially inward of said stepped recess, said cylinder portion having an upper end, a lower end, an inner periphery and a radially inward extending annular valve-lip flange, said annular flange being made of continuous metal fibers and being formed by bending said lower end radially inwards, said upper end of said cylinder portion being fitted in said stepped recess, thereby forming a first contacting surface in a radial plane, said method comprising

forming at least one annular stage portion on said center portion radially inwardly of said stepped recess and radially outwardly of said annular protrusion;



forming at least one matching annular stage portion on said inner periphery of said cylinder portion;

fitting said cylinder portion to said center portion contacting said at least one annular stage portion to said at least one matching annular stage portion thereby forming a second contacting surface while establishing a uniform spacing between said annular protrusion and said annular flange; and

welding said cylinder portion to said centering portion by electronic beam at said first contacting surface whereby said second contacting surface takes up any heat distortion generated by the welding so that said uniform spacing is maintained constant.

4,296,308

APPARATUS FOR WELDING IMPELLER

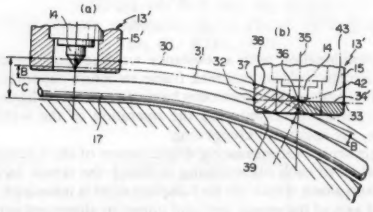
Syuhei Nakahama, and Etsu Yamashita, both of Chiba, Japan, assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 6, 1979, Ser. No. 72,843

Claims priority, application Japan, Sep. 6, 1978, 53/109274

Int. Cl.³ B23K *9/225*

U.S. Cl. 219—136 **10 Claims**



1. An apparatus for welding an impeller blade to a supporting plate of an impeller in which the impeller is held in a position to define between the impeller blade and the plate a V-shaped channel having an apex constituting a weld line including a straight horizontal portion and further including a curved portion extending continuously from the straight hori-

zontal portion and within a plane inclined with respect to a horizontal plane, said apparatus comprising:

a welding torch assembly having a tungsten electrode, a nozzle surrounding said electrode and in which said electrode is mounted and having a passage for an inert gas, said nozzle having an exterior shape with the opposite sides thereof shaped for contacting the inner surfaces of said V-shaped channel for maintaining a substantially fixed distance between the tip of said electrode and the straight horizontal portion of the apex of said V-shaped channel, a torch rod having said torch nozzle mounted on one end thereof and a gas pipe for supplying the inert gas to said nozzle; and

a translating mechanism on which the other end of said torch rod is mounted for universal pivoting movement relative to said head, said translating mechanism being movable for moving said torch head along and above the weld line with said nozzle engaging the inner surfaces of said V-shaped channel under the effect of gravity;

the size of the lower portion of said nozzle from the center line thereof to at least one end of the nozzle facing in the direction of the length of the apex line being reduced sufficiently to give the nozzle a shape for keeping the space between said electrode and the apex of the channel substantially the same as the spacing in the straight horizontal portion of the apex during movement of said nozzle along the curved portion of the apex by avoiding interference of the nozzle with the inner surface of the V-shaped channel during movement along the curved portion of the apex.

4,296,309

THERMAL HEAD

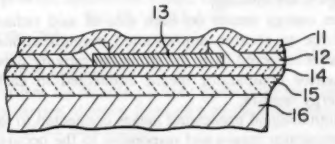
Akira Shinmi, Kawasaki; Masahisa Fukui, Yokohama; Toshitami Hara, Tokyo; Yoshiaki Shirato, Yokohama, and Yoshioki Hajimoto, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1978, Ser. No. 906,359

Claims priority, application Japan, May 19, 1977, 52-57936; Aug. 30, 1977, 52-103975; Sep. 7, 1977, 52-107522; Sep. 16, 1977, 52-111329; Oct. 13, 1977, 52-122622; Oct. 13, 1977, 52-122623; Oct. 13, 1977, 52-122624; Oct. 13, 1977, 52-122625; Oct. 28, 1977, 52-129482; Oct. 28, 1977, 52-129483; Oct. 28, 1977, 52-129484; Oct. 28, 1977, 52-129485; Oct. 28, 1977, 52-129486; Oct. 31, 1977, 52-131260; Oct. 31, 1977, 52-131261; Oct. 31, 1977, 52-131262; Dec. 28, 1977, 52-160137; Dec. 28, 1977, 52-160138; Dec. 28, 1977, 52-160139; Dec. 28, 1977, 52-160140; Dec. 28, 1977, 52-160143; Dec. 28, 1977, 52-160144; Dec. 28, 1977, 52-160145; Dec. 28, 1977, 52-160146; Dec. 28, 1977, 52-160147; Dec. 28, 1977, 52-160148; Dec. 28, 1977, 52-160149; Jan. 9, 1978, 53-1033; Jan. 9, 1978, 53-1034; Jan. 9, 1978, 53-1035; Jan. 11, 1978, 53-1806; Feb. 10, 1978, 53-14282; Feb. 10, 1978, 53-14283

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—216 **36 Claims**



1. A thermal head comprising means for producing a pattern on a recording medium in accordance with information to be recorded, said means including a substrate, a thin film resistive heater element overlying the substrate, and electrically conductive members overlying the resistive heater element for supplying the resistive heater element with electric power, wherein the resistive heater element comprises a metal boride.

4,296,310

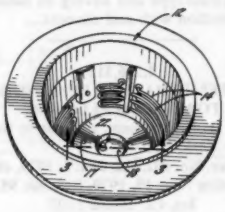
COOKING DEVICE WITH WATER DETECTING MEANS

Clement J. Luebke, Beloit, Wis.; John A. Mitchell, and Lowell W. Daniels, both of Rockford, Ill., assignors to Alco Standard Corporation, Valley Forge, Pa.

Filed Aug. 20, 1979, Ser. No. 68,108

Int. Cl.³ F27D *11/02*

U.S. Cl. 219—440 **7 Claims**



1. A pressure fryer comprising a vessel adapted to hold a food product and cooking oil, a removable cover for establishing a pressure-tight condition within said vessel, means for heating said vessel and the contents thereof, an electrical circuit for controlling said heating means, means in the lower portion of said vessel for detecting the presence of water in the lower portion of said vessel and for producing an electrical signal when more than a predetermined quantity of water is present in said vessel, and means in said circuit for automatically disabling said heating means when said signal is produced.

4,296,311

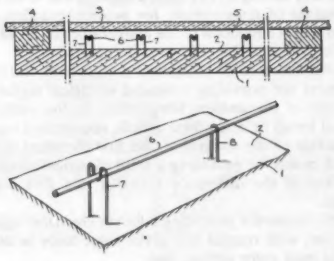
ELECTRIC HOT PLATE

Erik H. M. Hagglund, New Canaan, and Roger R. Giler, Wilton, both of Conn., assignors to The Kanthal Corporation, Bethel, Conn.

Filed Aug. 15, 1979, Ser. No. 66,684

Int. Cl.³ H05B *3/74*

U.S. Cl. 219—464 **1 Claim**



1. An electric cooking stove assembly comprising a glass plate, a convoluted molybdenum disilicide electric resistance heating wire forming a layer of interspaced convolutions substantially parallel with and spaced below said plate and having ends for connection with electric power, a refractory fibrous pad positioned below and completely free from contact with said layer and having a flat top surface substantially parallel with said layer, and means for supporting said layer so that when hot it radiates heat upwardly both directly and by reflection from said fibrous pad, the molybdenum disilicide wire of said element having a diameter and length which causes the wire to heat to temperatures substantially above 2000° F. when electrically powered at its rated voltage and at least the pad's said top surface having a substantially white color causing

appreciable diffused reflection of thermal energy having wave lengths inherent to said temperatures, said means comprising interspaced support wires having lower ends stuck in said fibrous pad, said support wires extending straight upwardly from the pad's said top surface, said wires having upper portions spaced above said pad and forming loops in which said molybdenum disilicide wire is positioned and thereby supported, said support wires having diameters no greater than said diameter of said molybdenum disilicide and made of metal alloy of the Fe-Cr-Al type and having an oxide coating protecting against reaction with said element.

4,296,312

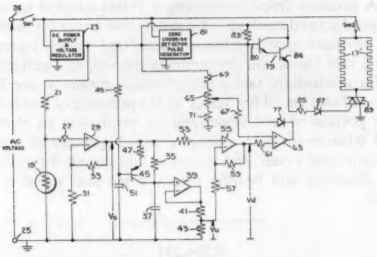
ELECTRONIC TEMPERATURE SENSING SYSTEM FOR TOASTER APPLIANCES

Robert J. Salem, Danbury, Conn., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 802,422, Jun. 1, 1979, abandoned. This application Nov. 19, 1979, Ser. No. 95,867

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—501 **31 Claims**



1. A temperature sensing system for sensing the heat applied to bread or other food article when loaded within the toast compartment of a toaster appliance so as to provide a consistent toast color for a given toast color setting for each toasting operation irrespective of starting conditions, comprising:

(a) first means, including a single temperature sensor to be positioned within the toast compartment of a toaster applicance and having an electrical characteristic which varies as a function of temperature, for providing a first electrical signal that is a function of the temperature of bread or a food article loaded within said toast compartment,

(b) second means to be positioned remote from the toast compartment for providing a second electrical signal that is a function of the ambient temperature in the vicinity of the loaded bread or other food article, said second signal being a function of the integral of said first electrical signal,

(c) third means for providing a third electrical signal that is a function of the difference between said first and second signals,

(d) fourth means for providing a fourth electrical signal that is invariant with respect to a given toast color as determined by the toast color setting, and

(e) fifth means responsive to the third and fourth signals for providing a fifth electrical signal for terminating the toasting operation upon said loaded bread or other food article having reached said given toast color.

4,296,313

GEAR SYSTEM AND METHOD OF ASSEMBLY

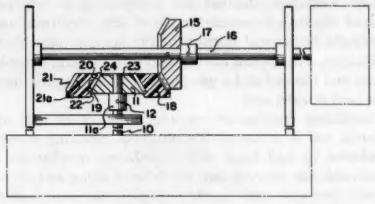
John A. Horner, 211 Grove St., Kawkawlin, Mich. 48631, and Dale W. Wright, Saginaw, Mich., assignors to John A. Horner, Kawkawlin, Mich.

Filed Dec. 26, 1979, Ser. No. 106,913

Int. Cl.³ G06C *25/00*

U.S. Cl. 235—61 L **12 Claims**

1. An adapter bevel gear for interposition between a driving first bevel gear and a driven second bevel gear normally in mesh with said first gear so as to be driven by the latter at a predetermined speed ratio relative thereto, said adapter gear comprising a body formed of resilient material and having an internal, frustoconical cavity of such size as snugly to accommodate one of said first and second gears, said cavity having tooth-accommodating recesses therein for the snug accommo-



dation of each of the gear teeth of said one of said gears, said adapter gear having a frustoconical exterior provided with teeth of such size as to mesh with those of the other of said first and second gears, the number of said external teeth being greater than the number of tooth accommodating recesses in said cavity, thereby to change said ratio.

4,296,314

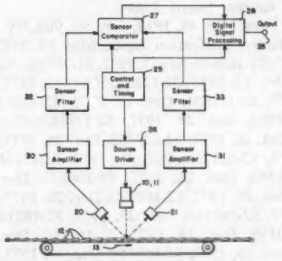
NON-CONTACT COUNTER

Kenneth W. Dabisch, and John S. Richards, both of Bolingbrook, Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 26, 1979, Ser. No. 97,472

Int. Cl.³ G06M *7/00*

U.S. Cl. 235—92 SB **2 Claims**



1. Apparatus for counting newspapers moving in overlapped relationship in a continuous stream comprising:

(a) a source of pulsed radiant energy disposed to direct a stream of energy against the overlapped papers in a direction substantially normal to the direction in which the papers are moving;

(b) an energy sensor on each side of said radiant energy source to receive nonrefracted omnidirectional energy that is reflected from the stream of moving papers;

(c) sensor comparator means connected to each of said energy sensors;

(d) digital signal processing means connected to said sensor comparator means and responsive to the occurrence of a preselected number of consecutive validated pulses to deliver a count pulse indicating the passage of a paper past the energy source; and

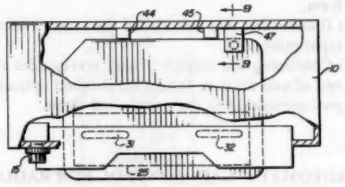
(e) control and timing connected to (i) said source of radiant energy, (ii) to said sensor comparator means and (iii) to said digital signal processing means to pulse said source of radiant energy and to provide a clock pulse to said digital processing means.

4,296,315

CARD READER SECURITY SYSTEM

Dan G. Weimer, Scottsdale, and Bradford O. Van Ness, Paradise Valley, both of Ariz., assignors to Engineered Systems, Inc., Tempe, Ariz.

Filed Apr. 16, 1979, Ser. No. 30,308
Int. Cl.³ G06K *7/08, 7/10, 19/06*
U.S. Cl. 235—460 **6 Claims**



1. A security system for a card reader for reading data encoded on cards having a magnetic shield area located on the cards and covering at least two spaced points therein, said security system including in combination;

a card entry throat in the card reader having a slot therein to accommodate cards to be inserted into the reader;

two spaced-apart magnetically actuated switch means located on one side of the slot in said card entry throat;

two corresponding spaced-apart permanent magnet means located on the other side of the slot in said card entry throat opposite different ones of said two spaced-apart magnetically actuated switch means respectively, each of said magnet means having a field of sufficient strength to operate the corresponding switch means located opposite such magnet means, the relative locations of said switch means and said permanent magnet means being such that the shield area of an inserted card breaks the field from the permanent magnet means operating on the corresponding one of said switch means;

card insertion sensing switch means operated from a first state of operation to a second state of operation only when a card is fully inserted into the card reader for reading thereby; and

electrical control circuit means connected with each of said two spaced-apart magnetically actuated switch means and said card insertion switch means and operated thereby only when a card having a magnetic shield area covering said at least two spaced points thereon in the proper area thereof is fully inserted into the card reader for reading thereby.

4,296,316

OPTICAL FOCUSING DEVICE

Shigeo Tsuji, Fujisawa, and Takahisa Aikawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 18, 1979, Ser. No. 104,803
Claims priority, application Japan, Dec. 25, 1978, 53-158529
Int. Cl.³ G01J *1/36*
U.S. Cl. 250—204 **4 Claims**

1. An optical focusing device for an optical information read-out system comprising:

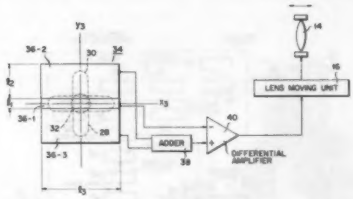
an object lens for focusing a light beam onto the surface of a data carrier, thereby forming a projected image on the surface of the data carrier;

means for moving said objective lens along the optical axis of said objective lens;

light beams orienting means positioned in the light beam path between said objective lens and said light source for orienting the light beam toward said objective lens to change the position of the projected image of the light beam on the surface of the data carrier;

optical guiding means for guiding part of the light beams reflecting from or transmitted through the surface of the data carrier onto an observation plane;

photodetecting means disposed on said observation plane which detects a shape of the projected image of the light beam guided by said optical guiding means and is comprised of a first narrow photoelectric surface extending in the direction of movement of the projected image of the light beam which is effected by said light beam orienting



means, and second and third photoelectric surface closely disposed to the first photoelectric surface;

means for summing the signals detected by said second and third surface; and

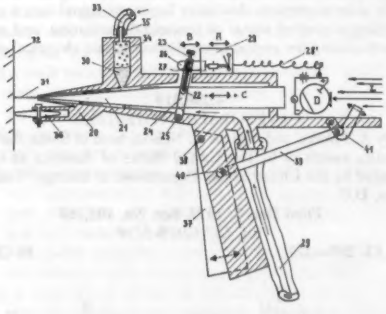
electrical means for comparing the output signal from said summing means with the detectes signal from said first photoelectric surface to provide a signal to said lens moving means, thereby moving said objective lens to a predetermined position.

4,296,317

PAINT APPLICATION METHOD AND MACHINE

Roland Kraus, Mainlände 7, 8702 Veitshöchheim, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,437
Int. Cl.³ G01D *15/18*
U.S. Cl. 250—215 **26 Claims**

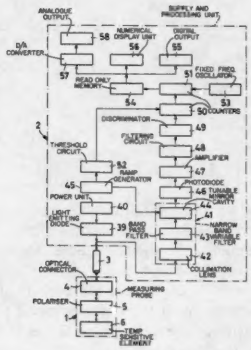


1. A paint application method comprising the steps of: guiding the spray opening of a spray gun at a constant distance from the working surface in the zone of picture reproduction; forcing paint into an air flow by pressure; controlling an amount of sprayed paint by the intensity of a light beam striking a photocell and controlled by a picture pattern; and moving photocell and the picture pattern synchronously with guide movement of the spray gun.

4,296,318
OPTO-ELECTRONIC INSTRUMENT FOR REMOTE TEMPERATURE MEASUREMENT

Sergio Mezzetti, Rho; Pierluigi Pizzolati, Cernusco Sul Naviglio, and Francesco Svelto, Rome, all of Italy, assignors to C.I.S.E. Centro Informazioni Studi Esperienze S.p.A., Italy

Filed Sep. 24, 1979, Ser. No. 78,322
Claims priority, application Italy, Sep. 22, 1978, 28012 A/78
Int. Cl.³ G02F *1/01*
U.S. Cl. 250—225 **7 Claims**

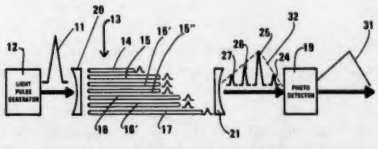


1. An opto-electronic instrument for remote temperature measurement, comprising a measuring probe and a remote supply and processing unit connected together by at least one optical fibre, said supply and processing unit includng a luminous signal generator for said optical fibre, said measuring probe including at least one polariser, and a temperature-sensitive element constituted by a square cross-section parallelepiped crystal of uniaxial double refraction material disposed with its optical axis at 45° to the plane of polarisation of said polariser, to receive the luminous signal transmitted through said optical fibre and to retransmit it to the same optical fibre in the form of a luminous signal the intensity of which varies sinusoidally with the wavelength, and in which the peaks are spaced apart by a distance dependent on the sensed temperature, said supply and processing unit including a variable frequency filter controlled by a ramp generator for transforming said retransmitted luminous signal into a luminous signal the intensity of which varies sinusoidally with time, an opto-electrical transducer able to convert this latter luminous signal into a corresponding electrical signal of sinusoidal oscillation, and means for calculating the period of oscillation of said electrical signal.

4,296,319
WAVEFORM SYNTHESIZER

Larry A. Franks, and Melvin A. Nelson, both of Santa Barbara, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1979, Ser. No. 101,369
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **10 Claims**



1. A method of transforming a readily available preselected optical input pulse of one shape into a preselected output waveform of an arbitrary but defined different shape comprising:

(a) Providing an array of a plurality of fiber optic waveguides having lengths preselected so that the illumination of one end of the array with said preselected optical input pulse will produce at the other end of said array a chain of optical pulses spaced apart in time in accordance with said preselected lengths, whereby the summation of said chain of pulses will approximate the preselected output waveform,

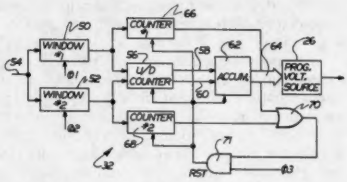
(b) Illuminating said one end of the array with said optical input pulse, and

(c) Combining the outputs of said waveguides at the other end of said array to form a synthesized optical pulse output approximating the preselected shape.

4,296,320
AUTOMATIC GAIN CONTROL FOR RADIATION ANALYZER

Samuel Miller, South Euclid, Ohio, assignor to Victoreen, Inc., Cleveland, Ohio

Filed Apr. 8, 1980, Ser. No. 138,652
Int. Cl.³ G01D *18/00*
U.S. Cl. 250—252 **9 Claims**



8. A method of regulating the system gain of a radiation detecting system comprising the steps of:

providing a known radiation source having a known peak in its energy spectrum;

detecting radiation particles given off by said known radiation source and providing an electrical pulse in response to the detection of each said particle, said pulses each having an amplitude directly related to the energy of the corresponding detected particle;

setting the gain of said pulses in accordance with a stored gain indication;

counting the difference between the numbers of particles producing pulses having amplitudes falling within amplitude ranges above and below a preselected amplitude which is desired to correspond to the particle energy at which said known peak is located in said energy spectrum;

adjusting said stored indication whenever said difference count exceeds a preselected limit; and,

resetting said difference count to an initial value whenever more than a selected number of electrical pulses in a predetermined amplitude range have occurred since the previous reset.

4,296,321
BIT PRESSURE GAUGE FOR WELL DRILLING

Donald W. Blincow, Claremont; Kevin H. Cassedy, Laguna Beach, and Samuel C. Dominey, Jr., Glendora, all of Calif., assignors to Tyco Laboratories, Exeter, N.H.

Filed May 5, 1980, Ser. No. 146,207
Int. Cl.³ G01V *5/00*
U.S. Cl. 250—254 **6 Claims**

1. Apparatus for measuring the pressure on a well drilling bit connected to a drilling platform by a string of drill pipe, including in combination:

first and second sections of drill pipe having telescoping

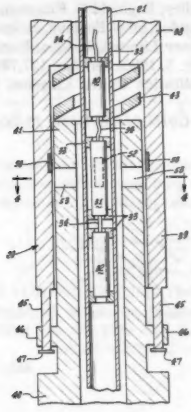
ends with said first section end sliding in said second section end;

a spring positioned between said first and second sections urging said second section away from said first section;

a probe positioned within said sections of drill pipe;

radioactive source means mounted on said second section end;

radiation detector means mounted in said probe, with said



first section end including window means providing a radiation path between said source and detector means; and

circuit means having said detector means connected as an input and providing as an output a signal varying as a function of radiation intensity at said detector means and hence of the position of said first section relative to said second section, the compression of said spring, and the pressure on said bit.

4,296,322

METHOD FOR ANALYZING ORGANIC SUBSTANCES

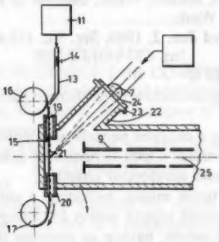
Reiner Wechsung, Cologne, Fed. Rep. of Germany, assignor to Leybold-Heraeus Gesellschaft mit beschränkter Haftung, Cologne, Fed. Rep. of Germany

Filed Aug. 27, 1979, Ser. No. 70,333

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837715

Int. Cl.³ B01D *59/44*

U.S. Cl. 250—282 **4 Claims**



1. A method for analyzing high molecular weight organic substances exiting from a chromatograph comprising subjecting such substance to laser radiation to produce negative ions therefrom, and subjecting those negative ions to time-of-flight mass spectroscopy.

4,296,323

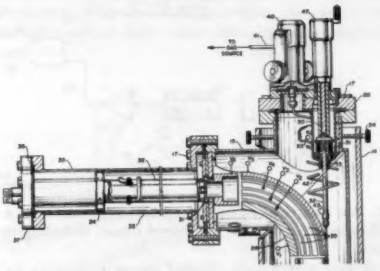
SECONDARY EMISSION MASS SPECTROMETER MECHANISM TO BE USED WITH OTHER INSTRUMENTATION

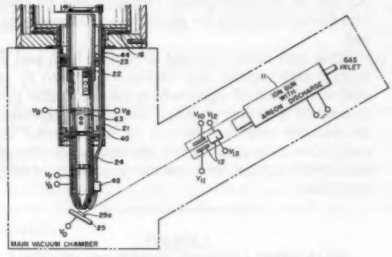
Robert L. Gerlach, Minnetonka, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 10, 1980, Ser. No. 128,932

Int. Cl.³ B01D *59/44*

U.S. Cl. 250—289 **11 Claims**





9. In a high definition spectroanalysis mechanism having capabilities of performing a plurality of analysis including a secondary ion mass spectrometry analysis of a preselected surface area, the mechanism comprising:

(a) a main vacuum chamber having an opening therein; said main vacuum chamber having means therein for producing secondary ions from said preselected surface area;

(b) a secondary vacuum chamber communicating with said main chamber through said opening therein;

(c) a flexible vacuum seal having an opening therein, said seal communicating with said main and secondary vacuum chambers permitting relative movement between said two vacuum chambers;

(d) means for imparting a limited movement of said secondary chamber with respect to said main chamber;

(e) a longitudinal extraction lens mechanism disposed adjacent the sample to be tested and extending between said main and secondary vacuum chambers and through said vacuum seal;

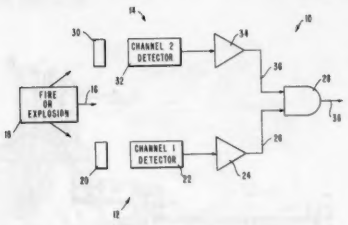
(f) a linear movement device connected to said longitudinal extraction lens mechanism to focus and withdraw said extraction lens with respect to said preselected surface area to be tested; and

(g) means, within said secondary vacuum chamber, for analyzing said secondary ions from said preselected surface area.

4,296,324
DUAL SPECTRUM INFRARED FIRE SENSOR

Mark T. Kern, Goleta, and Robert J. Cinzori, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 2, 1979, Ser. No. 90,701
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—339 **11 Claims**



1. An electrical detection system responsive to a fire or explosion for generating an output signal, including in combination:

(a) long wavelength channel means responsive to radiant energy in a predetermined spectral band greater than about 4 μm of electromagnetic radiation and received from a fire or explosion for generating a first logic signal;

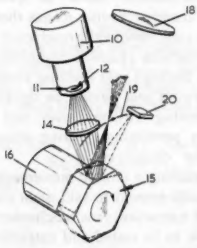
(b) short wavelength channel means responsive to radiant energy in a predetermined spectral band less than about 3.5 μm of electromagnetic radiation and received from said fire or explosion for generating a second logic signal; and

(c) output gate means coupled to receive both said first and second logic signals and responsive thereto to generate said output control signal which may be further processed to control the suppression of said fire or explosion, with the proviso that at least one of said channel means is responsive to an atmospheric absorption wavelength associated with at least one combustion product of said fire or explosion.

4,296,325
SCANNING MIRROR POSITION SYSTEM

Peter J. Berry, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed Mar. 10, 1980, Ser. No. 128,551
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—347 **2 Claims**

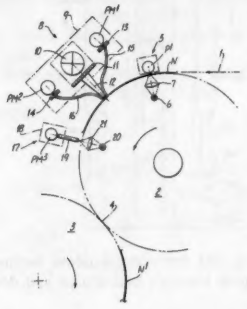


1. A radiation scanning system including a radiation detector, a radiation-imaging means for forming an image of radiation from a field of view, a scan member and a relay lens arranged to scan an image of the detector across the radiation image, and an arrangement for applying a characteristic radiation feature to the detector at a selected part of the detector image locus lying outside the normal scanned field of the system, wherein the radiation detector forms part of an assembly maintained at a temperature substantially below ambient, and said means for applying a characteristic radiation feature to the detector includes a mirror located on the scan locus of the detector image of the system and arranged to reflect radiation from the cooled assembly onto the detector.

4,296,326
WATERMARK DETECTION

John M. Haslop, Woodley; Reginald G. Knapman, Overton, and Michael A. West, London, all of England, assignors to Thomas De La Rue & Company Limited, London, England

Filed Mar. 5, 1980, Ser. No. 127,789
Claims priority, application United Kingdom, Mar. 6, 1979, 07936/79
Int. Cl.³ G01J *1/42;* G01N *21/38;* B42D *15/00;* G06K *9/74*
U.S. Cl. 250—372 **19 Claims**



1. A method of rejecting sheets which do not have a mould watermark (as herein defined), comprising the steps of:

measuring for each sheet, in an area in which a watermark is expected to be present, the absorption of ultraviolet radiation by the sheet;

measuring for each sheet, in the area in which a watermark is expected to be present, the transmittance of visible light by the sheet;

and rejecting sheets for which the said absorption measurement does not show a substantially constant value and also sheets for which the said transmittance measurement shows a substantially constant transmittance of visible light over the said area.

4,296,327
MULTI-STAGE COLLECTIVE FIELD CHARGED PARTICLE ACCELERATOR

John L. Adamski, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 2, 1980, Ser. No. 155,461
Int. Cl.³ H01J *27/00*
U.S. Cl. 250—423 R **10 Claims**

1. A multi-stage collective field charged particle accelerator, comprising:

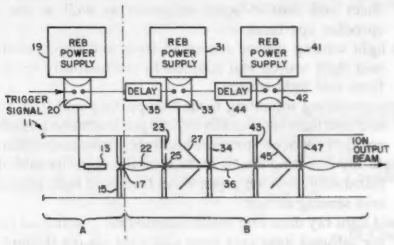
means forming a charged particle accelerator chamber;

a source of particles which in operation generates a particle plasma for said accelerator chamber;

first electron beam means, including a cathode source of electrons, power supply means for energizing said cathode, and an anode, having an opening therethrough, to which the electrons emitted from said cathode are discharged, the electron beam produced by said first electron beam means being characterized by a high current which exceeds the space charge limiting current, so that the electron beam stops downstream of the anode, thereby creating a space charge region which greatly accelerates a

portion of the particles in the particle plasma, said portion forming a high energy particle bunch;

at least one successive electron beam means, positioned



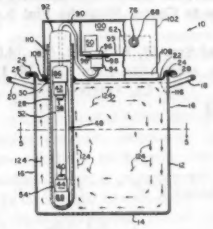
downstream of said first electron beam means, for further accelerating the particle bunch by creating another space charge region after it leaves said first electron beam means.

4,296,328

APPARATUS FOR PRODUCING HIGH PURITY WATER

Michael D. Regan, 40 Maple St., Medway, Mass. 02053

Filed Feb. 11, 1980, Ser. No. 120,725
Int. Cl.³ G01N *21/00*
U.S. Cl. 250—436 **8 Claims**



1. An apparatus for photochemically removing organic material from water comprising a container forming a non-continuously inflowing and outflowing type single chamber water reservoir for holding a batch of said water in said single chamber reservoir, means for producing electromagnetic radiation in the 185 nanometer wavelength range including a source of said radiation positioned in said container to effect a gentle steady state circulation of the water in said batch about said source of radiation, and means for venting to the atmosphere from said container gasses produced in said container by said radiation.

4,296,329

ALIGNMENT DEVICE FOR COMPUTERIZED TOMOGRAPHY PHANTOMS

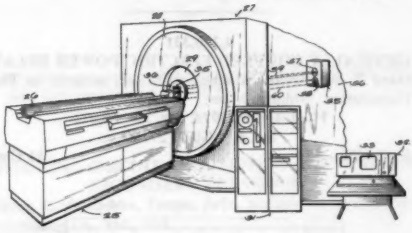
Paul J. Mirabella, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 22, 1979, Ser. No. 87,595
Int. Cl.³ G01N *21/00*
U.S. Cl. 250—491 **2 Claims**

1. Improved means for aligning the center of a calibration phantom with the isocenter of a computed tomography scanner apparatus, said scanner including an x-ray detector and an x-ray source for projecting an x-ray beam toward said detector while said source and detector are being orbited jointly about a longitudinal axis extending through said isocenter and constituting the center of an image reconstruction circle which lies between said source and detector in the x-ray beam path, said phantom comprising an x-ray transmissive cylinder having an end surface on which there are visible cross hairs which have a point of intersection coincident with the denter of the cylinder and which point it is desired to establish coincident with the isocenter for calibrating the scanner apparatus, and means for supporting said phantom is said beam path and for being shifted in any direction required to get said cross hair intersection and said longitudinal axis to coincide,

said improved aligning means comprising:

a laser light source means for being fixed in a predetermined location remotely from said phantom and generally in the direction in which said longitudinal axis extends, said laser light source being operative to project thin intersecting beams of coherent light which have the same angles be-



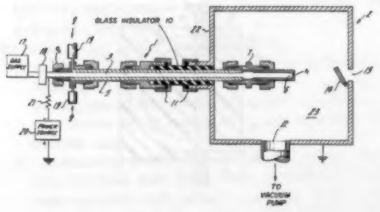
tween them as said cross hairs onto said phantom surface as luminous lines with the point of intersection of said beams being coincident with said isocenter and with the beams being simultaneously coincident with said cross hairs, said laser light source being adjustable to cause said beams to be coincident with the cross hairs of one of said phantoms after said one phantom has been shifted by means of its supporting means to a position where said center of the phantom cylinder coincides with said isocenter such that when any similar phantom is mounted for calibration purposes it will only be necessary to shift it until said intersecting laser light beams are coincident with its cross hairs to establish the similar phantom on the isocenter.

4,296,330

FLOWING GAS DISCHARGE SOURCE OF VACUUM ULTRA-VIOLET LINE RADIATION SYSTEM

George M. Thomson, Churchville, and Keith A. Jamison, Aberdeen, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1980, Ser. No. 140,646
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—504 R **4 Claims**



1. A vacuum ultraviolet line radiation system comprising:

(a) a gas supply;

(b) a tube means having an inlet operatively connected to

said gas supply, and an outlet end for carrying gas therethrough;

(c) a nozzle means fixedly mounted to the tube means at the outlet end of said tube means for sustaining an electrical discharge in an orifice positioned therein;

(d) a vacuum vessel circumambient said nozzle means having an outlet valve and outlet port axially aligned with said nozzle means and an evacuation port operatively positioned therein;

(e) a cooling jacket mounted longitudinally over said tube means;

(f) an insulator mounted upon said tube means between the inlet and outlet ends of said tube means, said insulator separating the tube means electrically from the vacuum vessel; and

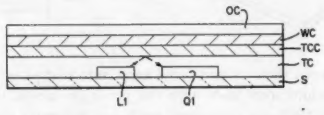
(g) a power source for negatively biasing said source tube means with respect to said vacuum.

4,296,331

OPTICALLY COUPLED ELECTRIC POWER RELAY

Edward T. Rodriguez, Winchester, Mass., assignor to Theta-Corporation, Woburn, Mass.

Filed Aug. 9, 1979, Ser. No. 65,072
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 **14 Claims**



1. Zero crossing a.c. power relay operable at several amperes and hundreds of volts, with optical isolation comprising, in a common plane,

at least one photosensitive SCR and at least one solid state junction light emitter optically coupled, from emitter face to SCR face,

the emitter and SCR being of planar form and housed in a common optical transmitting solid medium in substantially parallel and edge by edge relationship such that the emitter face does not directly oppose the SCR face,

the medium comprising a non-hemispherical surface dome over the emitter face and SCR face which is reflective,

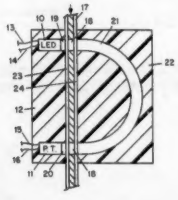
control means for the SCR limiting its turn on to within 2 volts.

4,296,332

SPROCKET HOLE SENSING DETECTOR FOR MOVING TRANSLUCENT PAPER SHEETS

Roy K. Hill, Bristol, Va., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,099
Int. Cl.³ G06K *7/14*
U.S. Cl. 250—570 **4 Claims**



1. An apparatus for sensing sprocket apertures in a translucent moving paper sheet in a reflective dust environment, the combination comprising,

a fixed source of light adapted to be directed in the path of a plurality of regularly spaced open sprocket apertures in said translucent moving paper sheet,

said light source having an intensity sufficient to continuously pass light through said translucent moving paper sheet and dust clogged apertures as well as the open sprocket apertures,

a light sensing device separated from and fixed relative to said light source and adapted to continuously sense rays from said light source,

encapsulating mounting means supporting said light source and said light sensing device at a predetermined number of regularly spaced sprocket apertures from each other, and

light ray directing means located on the opposite side of said translucent moving paper sheet from said light source and said sensing device,

said light ray directing means adapted for continuous receiving diffused light rays from said light source through said translucent moving paper sheet or dust clogged aperture in said moving sheet and for directing said diffused light rays through a different aperture in said same moving sheet to said light sensing device, whereby

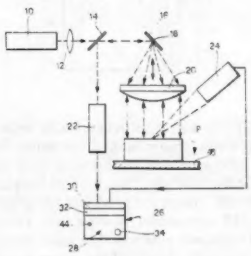
said light sensing device is adapted to continuously sense the level of light intensity being received and to distinguish between the presence or the absence of at least two thicknesses of said translucent moving paper sheet by sensing the light to dark ratio.

4,296,333

METHOD AND APPARATUS FOR DETECTING SURFACE DEFECTS IN A WORKPIECE

Emilio Milana, Rivalta, and Franco Rasello, Gabiano, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Sep. 10, 1979, Ser. No. 74,027
Claims priority, application Italy, Oct. 24, 1978, 69439 A/78
Int. Cl.³ G01N *21/48*
U.S. Cl. 250—572 **7 Claims**



1. A method of detecting surface defects in a workpiece which has undergone a mechanical operation,

the method comprising the steps of:

directing a beam of coherent monochromatic light radiation onto the surface of the workpiece in a direction normal thereto;

moving the light radiation beam and workpiece relative to each other whereby to effectively scan an area of the workpiece surface with the light radiation beam;

directing the specular component of the radiation beam which is reflected perpendicular to the workpiece by each point of the scanned area of said surface to a first photomultiplier arranged to output an electrical signal indicative of the intensity of said specular component;

sampling the component of radiation beam scattered from each point of the scanned area of said surface via a second photomultiplier arranged to output an electrical signal indicative of the intensity of said scattered component;

processing the output signals from the first and second pho-

tomultipliers so as to obtain a resultant signal substantially free of signal noise due to the surface roughness of the workpiece; and

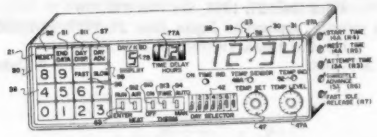
comparing said resultant signal with a reference threshold whereby to derive an indication of the presence of possible surface defects in the workpiece.

4,296,334

PROGRAMMABLE ELECTRONIC STARTING DEVICE FOR AUTOS AND THE LIKE WITH MEANS SELECTABLE TO ACTUATE ACCESSORIES

Gim Wong, 1849 Gibbs Rd., Estevan, Saskatchewan, Canada

Filed Sep. 7, 1978, Ser. No. 940,357
Int. Cl.³ F02N *11/08*
U.S. Cl. 290—37 R **16 Claims**



1. A programmable electronic starter device for the engines of vehicles and the like which include a source of electric power, throttle linkage, a starter solenoid and other electrical auxiliary equipment, comprising in combination an electronic timer, a time display device operatively connected to said electronic timer, a time setting keyboard for producing pulses, a memory unit, means operatively connecting said memory unit to said time setting keyboard for injection "ON" time and "off time" within said memory unit, thereby controlling the duration time of the operation of the engine said means including an encoder to translate said pulse into electrical impulses, an address selector counter operatively connected to said keyboard, means whereby each pulse from said keyboard operates said address selector counter, said address counter being operatively connected to said memory unit, a comparator module operatively connected to said memory unit and to said address selector counter and a duration counter operatively connected to said comparator module, an alarm output module operatively connected to said alarm duration counter and timer means operatively connected between said alarm output module and said throttle linkage, said starter solenoid and said other auxiliary electrical equipment to operate same selectively.

4,296,335

HIGH VOLTAGE STANDOFF MOS DRIVER CIRCUITRY

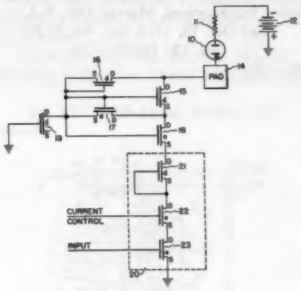
Robert J. Simcoe, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,300
Int. Cl.³ H01L *00/00;* H02H *9/00*
U.S. Cl. 307—200 B **24 Claims**

1. A high voltage standoff circuit for driving high voltage low current display devices directly with constant current, said circuit being compatible with large scale integrated circuits, comprising:

first, second and third MOSFETs connected in a loop so as to form therein a junction of said first and second MOSFETs, a junction of said second and third MOSFETs, and a junction of said first and third MOSFETs, said first, second and third MOSFETs having their gates connected directly to each other in common with the junction of said second and third MOSFETs;

control means coupled to the junction of said first and second MOSFETs; and diode means coupled to said junction of said second and third MOSFETs, and circuit being



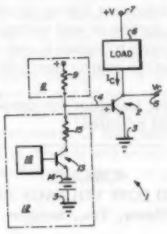
adapted to support high voltage applied to the junction of said first and third MOSFETs.

4,296,336

SWITCHING CIRCUIT AND METHOD FOR AVOIDING SECONDARY BREAKDOWN

William R. Skanadore, Tempe, Ariz., assignor to General Semiconductor Co., Inc., Del.

Filed Jan. 22, 1979, Ser. No. 5,157
Int. Cl.³ H03K *17/10, 17/64;* H01L *29/72*
U.S. Cl. 307—300 **1 Claim**



1. A method of operating a power transistor circuit to avoid secondary breakdown in a power transistor included in said power transistor circuit, said power transistor having base, collector, and emitter terminals, said power transistor having a secondary breakdown which is less than the BV_{CBO} voltage of said power transistor, said power transistor circuit including a load element for supplying collector current to said collector terminal, said method comprising the steps of:

(a) turning said power transistor on by conducting a first current into said base terminal, said first current being sufficiently large to cause a collector current to flow in said collector terminal and to cause said power transistor to become saturated;

(b) turning said power transistor off by

(i) conducting a first base turn-off current out of said base terminal to remove charge stored in the base and collector regions of said power transistor, said first base turn-off current being substantially less than said collector current, and

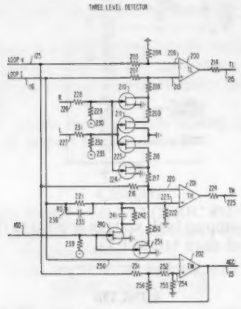
(ii) conducting a second base turn-off current out of said base terminal, said second base turn-off current being at least equal to said collector current, said second base turn-off current being conducted out of said base terminal only after a substantial amount of said charge in said base and collector regions has been removed by said first base turn-off current.

4,296,337

RESISTANCE DETECTOR WITH DELAYED HYSTERESIS

Dale E. Stone, Cedar Knolls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 15, 1979, Ser. No. 84,915
Int. Cl.³ H03K *5/24*
U.S. Cl. 307—356 **4 Claims**



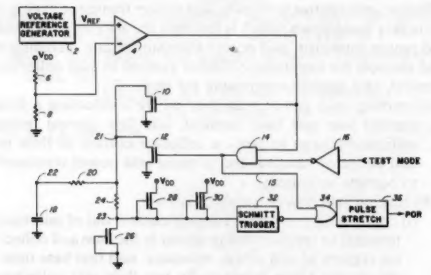
1. A threshold detector
characterized by
a differential amplifier having two inputs and an output,
means for applying a first signal across a voltage divider, a midpoint of which is connected to one of said inputs,
means for applying a second signal to the other of said inputs,
a first field effect transistor having its main electrodes connected across a portion of said voltage divider,
delay means responsive to signals at said output for applying control signals to the control electrode of said field effect transistor and
a second field effect transistor for connecting said voltage divider to ground potential.

4,296,338

POWER ON AND LOW VOLTAGE RESET CIRCUIT

James S. Thomas, Manor, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1979, Ser. No. 35,044
Int. Cl.³ H03K *5/153, 5/24, 17/687;* **H02J** *13/00*
U.S. Cl. 307—362 **19 Claims**



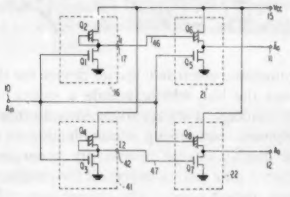
1. An integrated circuit for generating a reset signal when a first voltage falls below a second voltage, said first and second voltages derived from a supply voltage, said integrated circuit having connection means for coupling an external capacitor thereto, comprising:
reset signal generating means;
first means for generating a first reset enabling signal when said first voltage falls below said second voltage, said first reset enabling signal coupled to an input of said reset signal generating means and terminating when said first voltage exceeds said second voltage; and
second means for generating a second reset enabling signal, said second means responsive to said first reset enabling signal and coupled to an input of said reset signal generating means, said second reset enabling signal terminating a predetermined length of time after said first voltage exceeds said second voltage, said predetermined length of time dependent upon the charging time of said capacitor.

4,296,339

LOGIC CIRCUIT COMPRISING CIRCUITS FOR PRODUCING A FASTER AND A SLOWER INVERTED SIGNAL

Tatsunori Murotani, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1978, Ser. No. 973,776
Claims priority, application Japan, Dec. 27, 1977, 52-158839
Int. Cl.³ H03K *19/094, 19/003, 19/20*
U.S. Cl. 307—450 **9 Claims**



1. A logic circuit responsive to a variable input signal for producing a first and a second output signal that vary with phases opposite to and same as said input signal, respectively, said circuit comprising:
a first and a second inverter circuit responsive to said input signal for producing a first and a second inverted signal, respectively, one of said first and said second inverted signals varying with said input signal faster than the other of said first and said second inverted signals;
a first and a second buffer circuit;
first means for supplying said first inverted signal to said first buffer circuit; and
second means for supplying said second inverted signal to said second buffer circuit; and
third means for supplying said input signal to both of said first and said second buffer circuits;
whereby said first and said second buffer circuits produce said first and said second output signals, respectively.

4,296,340

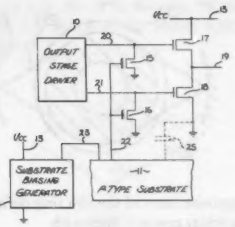
INITIALIZING CIRCUIT FOR MOS INTEGRATED CIRCUITS

Douglas F. Horan, Los Gatos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Aug. 27, 1979, Ser. No. 70,133
Int. Cl.³ H03K *17/284, 17/22, 17/16, 5/08*
U.S. Cl. 307—550 **10 Claims**

1. In an MOS integrated circuit employing a substrate biasing potential, a protection circuit for initially preventing the transmission of signals on a line in said integrated circuit when power is applied to said integrated circuit, comprising:
a transistor coupled to said line for preventing said transmission of said signals when said transistor is enabled, the gate of said transistor being coupled to receive said substrate biasing potential;
the threshold voltage of said transistor being selected such that said transistor is enabled in the absence of said substrate biasing potential and said transistor is disabled when

said substrate biasing potential reaches a predetermined level;



whereby prior to and during the period when said integrated circuit is initially powered, said signals are prevented from being transmitted.

4,296,341

SELF-STARTING SINGLE-PHASE SYNCHRONOUS MOTOR

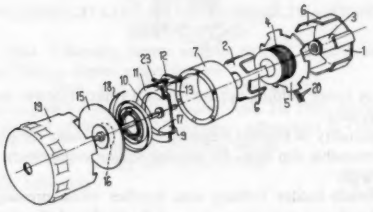
Kurt Güttinger, Murten, Switzerland, assignor to Sodeco-SAIA SA, Geneva, Switzerland

Filed Jun. 27, 1978, Ser. No. 919,737

Claims priority, application Switzerland, Jul. 15, 1977, 8763/77

Int. Cl.³ H02K *7/10*

U.S. Cl. 310—41 **10 Claims**



1. A self-starting single-phase synchronous motor comprising:

a generally bell-shaped permanently magnetized rotor;

a stator having two parts each with distinct poles;

a coil located inwardly of the rotor and having a core which is connected at its end to said two stator parts, one said stator part being located between said coil and rotor and the other said stator part being located outwardly of said rotor, said rotor being rotatably mounted on a shaft with defined friction;

a resilient coupling element interposed between said rotor and shaft, said resilient coupling element engaging said rotor and shaft for resiliently transmitting torque from said rotor to said shaft; and

locking means mounted on said rotor and acting on said rotor for locking said rotor preventing rotation in an undesired direction and for permitting starting of said rotor in the opposite, desired direction of rotation, said locking means located in front of said resilient coupling element on the power transmission path.

4,296,342

STARTER MOTOR

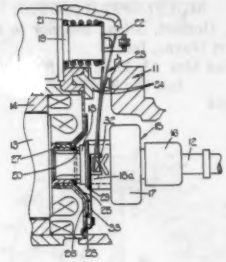
Donald A. Young, and Christopher P. Squires, both of Birmingham, England, assignors to Lucas Industries, Limited, Birmingham, England

Filed May 20, 1980, Ser. No. 151,755

Claims priority, application United Kingdom, May 25, 1979, 18384/79

Int. Cl.³ F16D *55/22;* F02N *11/02*

U.S. Cl. 310—77 **13 Claims**



1. A starter motor including an electric motor, a shaft rotatable by the motor, a pinion assembly carried by said shaft for rotation therewith, the pinion assembly being movable axially relative to the shaft between a rest position and an operative position, resilient means urging the pinion assembly to its rest position, and brake means operable to brake rotation of said driven shaft, said brake means comprising a brake disc mounted on said driven shaft for rotation therewith, a first friction member engageable with one face of the brake disc, a second friction member engageable with the opposite face of the disc, the first and second friction members being opposite one another, and a brake operating member movable in response to return movement of the pinion assembly to cause relative movement of the first and second friction member to grip the brake disc between them, so generating a braking action.

4,296,343

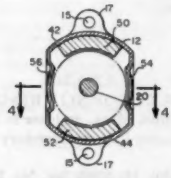
ELECTRIC MOTOR HOUSING, OR THE LIKE, WITH INTEGRAL POLE AND METHODS FOR MAKING SAME

Bobby E. McMillen, Columbus, Miss., assignor to AMBAC Industries, Incorporated, Farmington, Conn.

Filed Oct. 5, 1979, Ser. No. 82,178

Int. Cl.³ H02K *23/04*

U.S. Cl. 310—154 **6 Claims**



1. An electric machine including an armature supported on a shaft for rotation within a housing, the housing comprising:

a section of tubular ferrous material;

at least two magnetic field pole pieces secured within the tubular ferrous material to provide alternate poles having curved surface areas spaced from and conforming generally to the curvature of the armature, and;

at least two intermediate induced field pole pieces provided by inwardly projecting sections of side walls of the tubu-

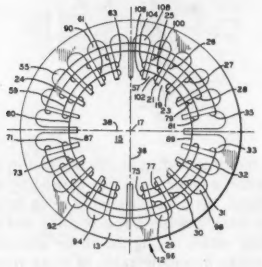
lar ferrous material and having arcuate face surfaces essentially equal in area to that of the magnetic pole pieces and spaced from the magnetic field pole pieces, said inwardly projecting pole pieces providing alternate intermediate poles for the machine by the induction effects generated from the magnetic field pole pieces in cooperation with the armature in the total magnetic flux path.

4,296,344

MULTI-SPEED MOTOR

Jerry R. Rabe, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 13, 1979, Ser. No. 20,182
Int. Cl.³ H02K *3/00*
U.S. Cl. 310—184 **11 Claims**



1. A stator assembly for a multi-speed motor operational in a plurality of different speed ranges including a core having an axially extending bore and axially extending slots communicating with the bore, and further including a main winding energizable in more than one speed range and at least two distinct auxiliary windings comprising a lower speed range auxilary winding and a higher speed range auxiliary winding, the lower speed range auxiliary winding being operable to start the motor for a lower speed range operation and the higher speed range auxiliary winding being operable to start the motor for higher speed range operation, the windings being accommodated within selected slots of the core with the main winding positioned radially outwardly of the lower speed range auxiliary winding relative to the bore and with the higher speed range auxiliary winding positioned radially inwardly of the lower speed range auxiliary winding relative to the bore; and said main winding comprising two pole groups selectively connectable to create four main poles for the lower speed range operation and to create two main poles for the higher speed range operation.

4,296,345

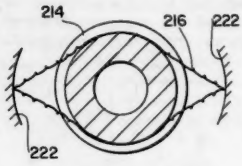
FLEXIBLE LOOP SLIP RING BRUSH

John B. Haberl, Dalton, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 14, 1980, Ser. No. 167,866
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—219 **20 Claims**

1. A brush for making electrical contact with peripheral portions of a slip ring rotatable within a housing comprising:

flexible wire means having opposite extremities anchored at locations diametrically opposite the slip ring, said wire means having helical formations therein and including opposed runs defining a loop when passed on opposite sides of the slip ring, said wire means being stretched so that compressive force is exerted by the wire means to resiliently contract the loop whereby the opposed runs are caused to embrace substantial arcuate peripheral portions on opposite sides of the slip ring defining a brush for sliding electrical contact therewith.

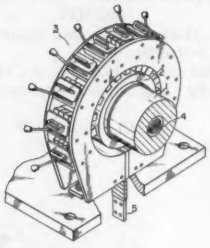


4,296,346

BRUSH HOLDING APPARATUS FOR ROTARY ELECTRIC MACHINE

Norihiro Ooki, Katsuta; Shoji Motegi, Hitachi; Yasuyuki Wachi, Takahagi; Yoshio Takikawa, Hitachi, and Norio Yamakawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Filed Nov. 20, 1979, Ser. No. 95,951
Claims priority, application Japan, Nov. 29, 1978, 53-146562
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—242 **9 Claims**



1. A brush holding apparatus for a rotary electric machine comprising:

a plurality of brushes disposed along the outer periphery of rotatable slip rings for making sliding engagement therewith;

a brush holder holding said brushes while pressing said brushes against the outer periphery of said slip rings at a predetermined pressure, said brush holder being provided on its head with an insulated handle;

retaining means fixedly mounted on a portion of said brush holder and shaped in the form of a wedge having its transverse width gradually narrowed toward said slip rings;

stationary means shaped to be engageable with said retaining means and spaced from said slip rings by a predetermined distance;

securing means for detachably securing said retaining means to said stationary means, said securing means including a retaining lug protruding from and fixed to a portion of said brush holder, and a lug-engaging cam supported in said stationary means so as to be engageable with said retaining lug; and

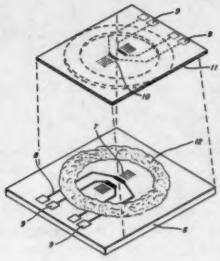
a manipulating lever pivotally coupled at one end thereof to a portion of said lug-engaging cam to cause angular rotation of said cam around its axis, said securing means being engaged with or disengaged from said retaining means in response to the manipulation of said manipulating lever whereby said brush holder can be mounted on or detached from said stationary means.

4,296,347

SURFACE ACOUSTIC WAVE SENSOR

Donald F. Weirauch, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1979, Ser. No. 79,735
Int. Cl.[3] H01L *41/02;* H03H *9/05*
U.S. Cl. 310—313 B 10 Claims



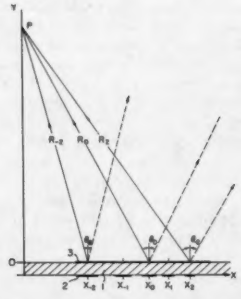
1. A surface acoustic wave sensor comprising a first member having a first relatively flat surface, a second member having a second relatively flat surface, a first surface acoustic wave array positioned upon said first surface, a second surface acoustic wave array positioned upon said second surface, first electrical connection means for making electrical connections to said first array, second electrical connection means for making electrical connections to said second array, said first surface acoustic wave array and said second surface acoustic wave array disposed in proximity one to the other so as to create a capacitive coupling effect between said arrays, and a fired glass frit bonding agent solely disposed between said first and second surfaces to form an enclosed chamber between said first and said second members while rigidly affixing said first and said second members each to the other, said chamber enclosing at least one of said first and said second arrays.

4,296,348

INTERDIGITATED ELECTRODE ULTRASONIC TRANSDUCER

Kohji Toda, Yokosuka, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan, a part interest

Filed Aug. 20, 1979, Ser. No. 68,273
Claims priority, application Japan, Aug. 21, 1978, 53/100929
The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.
Int. Cl.[3] H01L *41/08*
U.S. Cl. 310—334 6 Claims



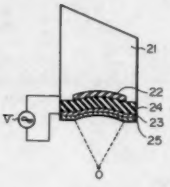
1. An ultrasonic transducer characterized by comprising a piezoelectric substrate whose thickness is substantially smaller than wavelength (λ) of an ultrasonic wave in said substrate and an interdigital electrode means disposed on one side surface of said substrate, so that as AC voltages are applied to said interdigital electrode means while keeping the opposite side surface of said substrate in contact with a liquid medium ultrasonic waves are radiated toward said liquid medium.

4,296,349

ULTRASONIC TRANSDUCER

Toshiharu Nakanishi, Kamakura; Miyo Suzuki, Fujisawa, and Hiroji Ohigashi, Zushi, all of Japan, assignors to Toray Industries, Inc., Japan

Filed Feb. 12, 1980, Ser. No. 120,782
Claims priority, application Japan, Feb. 13, 1979, 54-15177
Int. Cl.[3] H01L *41/08*
U.S. Cl. 310—335 11 Claims



1. An improved ultrasonic transducer, comprising: a piezoelectric film with associated electrodes and a reflective layer bonded to the said piezoelectric element,

said reflective layer having a thickness in a range from 1/32 λ to 3/16 λ,

and said λ being the wavelength of sound waves within said reflective layer at one half of free resonant frequency of the said piezoelectric film.

4,296,350

GASEOUS FLUORESCENT DISCHARGE LAMP

Jakob Maya, Boston, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 21, 1979, Ser. No. 106,297
Int. Cl.[3] N01J *1/02*
U.S. Cl. 313—26 5 Claims

1. An arc discharge device comprising a source of UV emission and a chamber external thereto containing a substance which, in vapor form, comprises gaseous molecules which absorb said UV emission and are raised to a highly excited state, from which the excited molecules relax to a lower intermediate energy state and then to a ground state, one of the two latter states being optically coupled to the immediate higher energy state so that the transition of said molecules from either the highly excited state to the intermediate state or from the intermediate state to the ground state results in the emission of visible radiation.

4,296,351

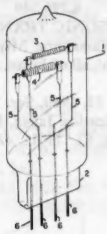
TUNGSTEN HALOGEN LAMP HAVING LEAD-IN WIRE COMPRISING TANTALUM ALLOY

Stephen F. Kimball, North Andover, and Peter R. Gagnon, Salem, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 17, 1979, Ser. No. 86,182
Int. Cl.[3] H01K *1/28*
U.S. Cl. 313—222 10 Claims

1. A tungsten halogen incandescent lamp comprising two

tungsten filaments supported on lead-in wires and disposed within a glass envelope, the glass envelope containing a fill of inert gas and halogen in elemental or compound form, the two tungsten filaments having different tungsten evaporation rates



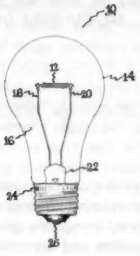
during normal operation, the lead-in wires comprising an alloy including tantalum the purpose of which is to provide satisfactory lamp operation at the two different tungsten evaporation rates.

4,296,352

INCANDESCENT LAMP

Ivan Berlec, South Euclid, and Lewis V. McCarty, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,329
Int. Cl.[3] H01K *1/42, 7/08*
U.S. Cl. 313—315 **16 Claims**



1. An incandescent lamp filament comprising a tungsten wire having an inner core of tungsten crystals doped with grain growth promoting additives selected from aluminum, silicon and potassium compounds to exhibit sag resistance and a surface layer of chemically vapor deposited undoped tungsten crystals imparting increased vibration damping and lower shear modulus value at elevated temperatures to the lamp filament.

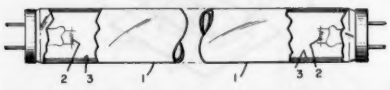
10. An incandescent lamp having a transparent envelope which contains a tungsten filament comprising a tungsten wire having an inner core of tungsten crystals doped with grain growth promoting additives selected from aluminum, silicon and potassium compounds to exhibit sag resistance and a surface layer of chemically deposited undoped tungsten crystals imparting increased vibration damping and a lower shear modulus value at elevated temperatures to improve the vibration resistance.

4,296,353

FLUORESCENT LAMP HAVING HIGH COLOR RENDERING INDEX

Wolfgang Walter, Brookline, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 29, 1979, Ser. No. 89,642
Int. Cl.[3] H01J *1/62*
U.S. Cl. 313—487 **9 Claims**



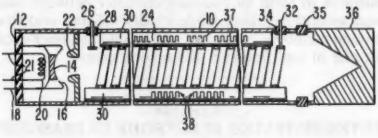
1. A fluorescent lamp having a high color rendering index and high efficacy comprising a glass envelope having electrodes at its ends and containing a fill including mercury and a starting gas, and a phosphor coating on the inner surface of the glass envelope, the phosphor coating comprising a blend of four narrow band emitting phosphors, the respective peak emissions of said four phosphors being in the regions of about 450–480 nm, 510–540 nm, 570–590 nm and 600–630 nm.

4,296,354

TRAVELING WAVE TUBE WITH FREQUENCY VARIABLE SEVER LENGTH

Michael L. Neubauer, Menlo Park, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 28, 1979, Ser. No. 98,011
Int. Cl.[3] H01J *25/34*
U.S. Cl. 315—3.5 **25 Claims**



1. A traveling tube having internal gain compensation, comprising:

A helix-type interaction circuit for supporting interaction of an electron beam with microwave signals over an operable band of frequencies, said interaction tending to produce a gain varying with frequency, a first attenuator resonant at a first frequency within said operable band and coupled to said interaction circuit over a first length of said interaction circuit, and a second attenuator resonant at a second frequency within said band and coupled to said interaction circuit over a second length, said first and second frequencies being generally identified with frequencies in said operable band whose gain is sought to be compensated, whereby gain of said frequencies within said operable bandwidth is automatically compensated internally.

20. A traveling wave tube having noise-resistant internal gain compensation comprising:

a helix-type slow-wave circuit having an input end for microwave signals, said signals interacting with a linear electron beam over a selected band of frequencies, said interaction tending to produce a gain which varies with frequency,

a dielectric rod near said circuit extending in the direction of the axis of said slow-wave circuit; and

a first resistive conductor shaped to form a circuit resoanant at a first frequency within said tube, said conductor being attached to the surface of said rod so as to extend over a first length of said slow-wave circuit; and

a second resistive conductor shaped to form a circuit resi-

dent at a second frequency within said band, said conductor being attached to the surface of said rod so as to extend over a second length of said slow-wave circuit;

said conductors both being spaced away from said input end, said conductors providing respective different degrees of attenuation about said first and second frequencies to compensate said gain varying with frequency without degrading the anti-noise properties of said tube.

4,296,355

MAGNETRON WITH COOLING MEANS

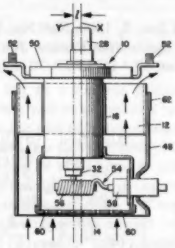
Akihiro Fukatsu, and Isao Tada, both of Yokohama, Japan, assignors to Toshiba Corporation, Kawasaki, Japan

Filed Nov. 13, 1979, Ser. No. 93,898

Claims priority, application Japan, Nov. 13, 1978, 53-155877[U]

Int. Cl.³ H01J *25/50*

U.S. Cl. 315—39.51 **5 Claims**



1. An internal type magnetron comprising:

an anode having an anode axis;

a cathode disposed within said anode;

an antenna terminal disposed along an antenna axis which is offset from and substantially parallel to said anode axis; and

a cooling means surrounding said anode for cooling said anode, said cooling means having an outermost periphery, each point on the periphery lying at a substantially uniform radial distance from said antenna axis.

4,296,356

IONIZATION VACUUM GAUGE CIRCUIT

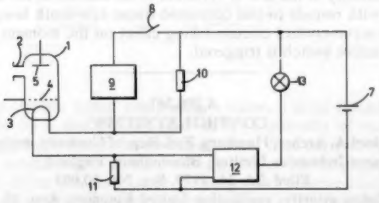
Karl Beinitz, Cologne, and Joachim Schubert, Wesseling, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Postfach, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,480

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853677

Int. Cl.³ G08B *21/00*; H05B *37/03*

U.S. Cl. 315—135 **9 Claims**



1. In a circuit for an ionization vacuum gauge having a thermionic filament, a control circuit receptive of current for maintaining a constant current flow between the cathode and anode of the gauge and a switch for applying current to the control circuit, the improvement comprising: circuit means for indicating a filament interruption independent of the state of the switch including at least one resistor by-passing the switch to provide a continuous sensing current to the filament and means for detecting an interruption in the sensing current and for indicating such an interruption.

4,296,357

PLASMA DISPLAY SYSTEM

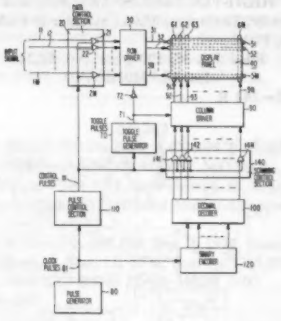
Tsutomu Hirayama, and Hiroshi Hada, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 947,227, Sep. 29, 1978, abandoned. This application Nov. 2, 1979, Ser. No. 90,718

Claims priority, application Japan, Sep. 29, 1977, 52-117622; Jul. 14, 1978, 53-86268; Aug. 8, 1978, 53-97079

Int. Cl.³ H05B *41/30*

U.S. Cl. 315—169.4 **12 Claims**



1. An external electrode type plasma display apparatus comprising a group of first electrodes and a group of second electrodes disposed in an opposed relation to each other by the intermediary of a discharging gas to form cells therebetween, a dielectric coating covering the surface of the electrodes of at least one group exposed to said gas,

a first driver circuit applied to said first electrodes and having a plurality of input terminals,

a second driver circuit coupled to said second electrodes and having a plurality of input terminals,

a scanning control means for applying a first signal successively to said input terminals of said first driver circuit for a predetermined period at a predetermined interval,

said first driver circuit including means for producing a group of first voltage pulses in response to said first signal and means for applying said first voltage pulses successively to said first electrodes, said first voltage pulses having a predetermined first amplitude with a predetermined polarity, said first amplitude being smaller than a firing voltage of the cells,

a signal means for selectively applying a second signal to at least one of said input terminals of said second driver circuit for said predetermined period in synchronism with said first signal,

said second driver circuit including means for producing at least one second voltage pulse of an amplitude smaller than said firing voltage in response to said second signal and means for applying said second voltage pulse to said second electrode group so as to produce a first alternating voltage between the electrodes associated with a selected cell in combination with said first voltage pulses, said first alternating voltage having a second amplitude with one and opposite polarities, said second amplitude being larger than said firing voltage,

means for applying a third signal simultaneously to all of said input terminals of said first driver circuit, said first driver circuit further including means for producing a third

voltage pulse and means for applying said third voltage pulse to a plurality of said first electrodes, and

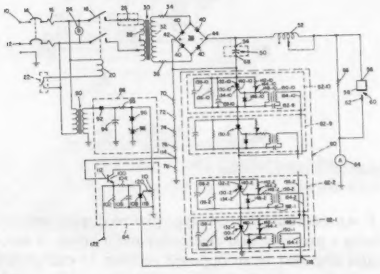
means for applying a fourth signal to all of said input terminals of said second driver circuit in synchronism with said third signal, said second driver circuit further including means for producing a fourth voltage pulse and means for applying said fourth voltage pulse to a plurality of said second electrodes so as to produce a second alternating voltage between said plurality of first electrodes and said plurality of second electrodes, said second alternating voltage having an amplitude larger than said firing voltage and a frequency lower than that of said first alternating voltage so that the number of discharging times due to said second alternating voltage is smaller than that due to said first alternating voltage.

4,296,358

HIGH-VOLTAGE SPARK SOURCE

John A. Bernier, Lexington, Mass., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Jul. 30, 1979, Ser. No. 62,244
Int. Cl.³ H05B 7/20
U.S. Cl. 315—241 R **18 Claims**



1. A spark source for spectrochemical analysis comprising a spark gap for receiving a sample to be analyzed,

a storage capacitor,

a discharge circuit including reactive means connected in circuit between said capacitor and said spark gap,

discharge control means for discharging said capacitor through said spark gap, and

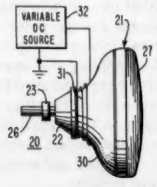
switching means for effectively removing said capacitor from said discharge circuit after a brief initial interval of current flow through said spark gap so that the current flow through said spark gap is essential unidirectional.

4,296,359

TELEVISION DISPLAY ERROR CORRECTION

Dennis L. Dodds, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1979, Ser. No. 88,657
Int. Cl.³ H01J 29/56
U.S. Cl. 315—370 **5 Claims**



1. A method for correcting the effects on a display raster of an electron gun mount rotation error in a color kinescope having in-line electron guns and a display screen, comprising the steps of:

aligning the horizontal deflection axis of a deflection yoke mounted on said kinescope with the axis of alignment of said kinescope electron guns; and

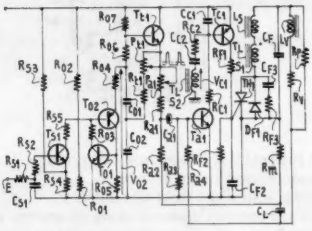
generating, at a location adjacent to the exit end of said deflection yoke, an electron-influencing magnetic field extending in a direction orthogonal to the directions of the horizontal and vertical deflection fields produced by said deflection yoke and of a magnitude and polarity chosen to effect alignment of the horizontal axis of said display raster with the horizontal axis of the kinescope display screen.

4,296,360

SWITCHED-MODE FRAME-SCAN CONTROL CIRCUIT FOR A VIDEOFREQUENCY RECEIVER

Gerard Rilly, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Jun. 4, 1980, Ser. No. 156,462
Claims priority, application France, Jun. 7, 1979, 79 14590
Int. Cl.³ H01J 29/70, 29/72
U.S. Cl. 315—387 **8 Claims**



1. A switched-mode frame-scan control circuit comprising a circuit for generating a saw-tooth signal having an active switch monodirectional in voltage and bidirectional in current, connected to the terminals of a load comprising the vertical deflector in series with a measuring resistor and a connecting capacitor, wherein the active switch is controlled by a cyclic ratio control circuit connected, on the one hand, to a static servo-control circuit one input terminal of which is connected to the positive terminal of the connecting capacitor and the other input terminal to a reference DC voltage generator, so as to maintain a sufficiently high and stable voltage at the terminals of this capacitor for optimum operation of the active-switch circuit and, on the other hand, to a dynamic servo-control circuit one input terminal of which is connected to the measuring resistor and the other input terminal to a circuit for generating frame saw-teeth corrected into an S, so as to ensure conformity of the law of variation of the current in the deflector with respect to this corrected frame saw-tooth law; these two servo-control circuits taking effect on the moment when the active switch is triggered.

4,296,361

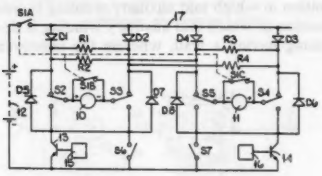
CONTROL SYSTEMS

Michael A. Archer, Hamburg, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 24, 1979, Ser. No. 60,001
Claims priority, application United Kingdom, Aug. 15, 1978, 33341/78
Int. Cl.³ H02P 1/54
U.S. Cl. 318—54 **5 Claims**

1. A control system for a pair of driving motors of a vehicle, the vehicle being of the kind in which road wheels on opposite sides of the vehicle are driven by the motors respectively, the

steering of the vehicle being achieved by varying the electric current flow to the two motors whereby, in use, one motor can drive its associated road wheel more quickly than the other to achieve a steering action, the control system comprising first and second motor control circuits for the motors respectively, each motor control circuit comprising first and second changeover switches, the switches having common terminals connected to the supply terminals respectively of the associated motor and each switch having first and second changeover terminals, diodes respectively connecting the first changeover terminals of each changeover switch to one terminal of a source of supply, the second changeover terminals being connected to the other terminal of the source of supply whereby



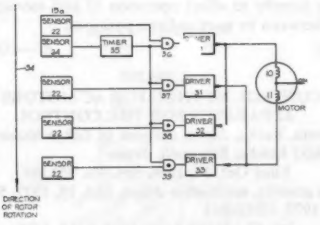
when said switches are in a neutral position, the common terminals of the switches will be connected to said first changeover terminals and to the one terminal of the source of supply through said diodes, and in a drive position one of the common terminals of a switch will be connected to said second changeover terminal corresponding therewith and to the other terminal of the source of supply, the first and second changeover switches in each motor control circuit being operable to change the direction of current flow through the associated motor, characterized by a pair of resistors connected between the motor control circuits, said changeover switches when in said neutral position connecting the motors in series with each other and with said pair of resistors.

4,296,362

MOTOR HAVING ELECTRONICALLY SWITCHED STATOR FIELD CURRENT AND INTEGRAL TORQUE CONTROL

Denny D. Beasley, Cincinnati, Ohio, assignor to Beasley Electric Corporation, Georgetown, Ohio

Filed May 18, 1978, Ser. No. 907,120
Int. Cl.[3] H02P *6/02*
U.S. Cl. 318—138 **12 Claims**



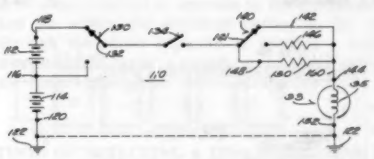
1. An electric motor comprising a stator, a rotor rotatably mounted on a shaft within said stator, a plurality of stator windings, and a circuit for switching stator field currents, said circuit comprising a positive current driver and a negative current driver for each stator winding, said positive current driver operating to permit current flow in one direction through said winding for part of the rotor rotation, said negative current driver operating to permit current flow in the opposite direction for a succeeding part of the rotor rotation, said circuit further comprising sensing means associated with each of said drivers to sense rotor position and produce outputs to cause said associated driver to permit said current flow, said sensing means including means for successively causing current flow through each of said stator windings in turn such that current flows in only one stator winding at a time, said sensing means comprising a plurality of spaced optical interrupters fixedly mounted with respect to the rotor shaft and at substantially equal radial distances therefrom, each of said interrupters having an optical source, an optical receiver and a space therebetween defining an optical path, said sensing means further including a substantially circular plate coaxial with the rotor shaft and adapted to rotate therewith, said plate containing a slot extending circumferentially along the outer edge of said plate of a length corresponding to said part of the rotor rotation that current flows through the windings, said plate being interposed within said optical paths such that a particular one of said optical receivers produces an output only when said slot is within the optical path associated with that receiver, one of said interrupters including a second optical source, optical receiver and space therebetween defining an optical path, and said plate contains a plurality of spaced apertures substantially radially equidistant from the center of said plate such that said second optical receiver produces an output each time one of said apertures traverses said second optical path.

4,296,363

SPEED SELECTION FOR A DIRECT CURRENT PERMANENT MAGNET MOTOR

Charles H. Blake, Park City, and Donald H. Wood, Gurnee, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 504,353, Sep. 9, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,690
Int. Cl.[3] B63H *21/26*; H02B *7/00*
U.S. Cl. 318—349 **8 Claims**



1. A speed control circuit for a permanent magnet, direct current motor comprising a source of direct current, a permanent magnet motor including an armature winding having opposed terminals, and speed control means including a first resistor connected between one of said armature winding terminals and said direct current source, a second resistor connected to said one armature winding terminal, a shunt lead connected to said one armature winding terminal, and a switch connected to said direct current source and selectively operable between a first position connecting said direct current source to said shunt lead in parallel with said first resistor and disconnected from said second resistor, a second position connecting said direct current source to said second resistor in parallel with said first resistor and disconnected from said shunt lead, and a third position disconnected from both of said shunt lead and said second resistor, whereby current flow from said current source to said armature winding is solely through said first resistor.

4,296,364

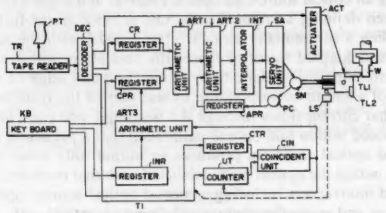
TOOL COMPENSATION SYSTEM

Hiroomi Fukuyama, Hachioji, and Shinichi Isobe, Tachikawa, both of Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Mar. 26, 1980, Ser. No. 134,120
Claims priority, application Japan, Sep. 27, 1978, 53-118840
Int. Cl.[3] G05B *19/25*
U.S. Cl. 318—572 **11 Claims**

1. In a tool compensation system of the type which includes

a command value register for storing a movement command value, a compensation value register for storing a tool compensation value, and means for shifting a tool from a position represented by the movement command value to a position spaced apart therefrom a distance corresponding to the tool compensation value, the improvement comprising:



first means for counting the amount of use of the tool; and

second means responsive to said first means for correcting the content of the tool compensation value register by a preset value each time the count value of the first means has reached a predetermined value.

4,296,365

METHOD AND APPARATUS FOR CORRECTING ERRORS OF FEEDING OF ENDLESS BELT IN AUTOMATIC SCREEN PRINTING

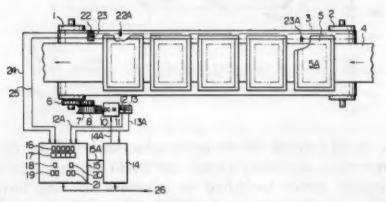
Takaharu Yoshikawa, Takatsuki, Japan, assignor to Toshin Kogyo Co. Ltd., Hyogo, Japan

Filed Sep. 13, 1979, Ser. No. 75,333

Claims priority, application Japan, Apr. 6, 1979, 54-41080

Int. Cl.³ G05D *23/275*

U.S. Cl. 318—632 **14 Claims**



1. In an automatic screen printing process comprising the steps of presetting the repeat length of an endless belt as a pulse number and intermittently driving an endless belt-driving roller based on the preset pulse number, a method for correcting feed errors including the steps of correcting feed errors owing to unevenness of thickness and elongation at individual positions of the endless belt by increasing or decreasing the pulse number prior to printing and feeding of the endless belt at every repetition for printing under control of said increased or decreased pulse number.

4,296,366

MOTOR STARTING SWITCH

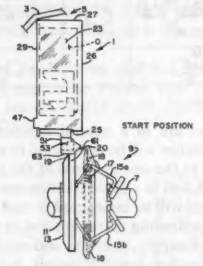
Eugene F. Hildebrandt, and Thomas V. Ottersbach, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 9, 1979, Ser. No. 82,769

Int. Cl.³ H02P *5/30*

U.S. Cl. 318—793 **4 Claims**

1. In a dynamoelectric machine, such as an electric motor, comprising a stator, a rotor and a shaft journalled with respect to the stator and supporting the rotor, said shaft having a longitudinal axis, said motor further including an auxiliary winding and a starting switch operable to de-energize said auxiliary winding upon the motor obtaining a predetermined speed during start up, said motor further including a centrifugal actuator mounted on said shaft and operatively connected to said starting switch for actuation of the latter in response to said rotor obtaining said predetermined speed, said centrifugal actuator having a portion thereof shiftable axially upon said shaft between a start position and a run position upon start up of the motor and upon said rotor obtaining said predetermined speed and being shiftable in reverse direction from its run to its start position upon slowing or stopping of the rotor thereby to reset said starting switch, the latter having a housing adapted to be secured in fixed position relative to said centrifugal actuator and having at least one switch contact therewithin movable in response to movement said centrifugal actuator between a start position in which said auxiliary winding is energized and a run position in which said auxiliary winding is de-energized, said housing having a wall, wherein the improvement comprises: an opening in said housing wall, said opening being offset to one side of said longitudinal axis of said shaft, a post secured to said housing and located within said opening, said post extending generally parallel to the longitudinal axis of said shaft, an actuator member journalled on said post, said actuator member having a cam follower extending from said post in generally transverse direction with respect to said longitudinal axis of said shaft and being cammingly engageable with said centrifugal actuator portion on the other side of said longitudinal axis from said post as said centrifugal actuator portion shifts axially between its run and start positions, said actuator member further having a movable contact lever disposed within said housing and cooperable with said movable switch contact, said actuator member being rotatable on said post in a generally radial direction with respect to said centrifugal actuator portion as the latter shifts axially between its start and run positions thereby to effect operation of said movable switch contact between its start and run positions.



4,296,367

SPEED CONTROL METHOD FOR AC MOTORS AND AN APPARATUS FOR THE CONTROL

Akio Hirata, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 18, 1978, Ser. No. 952,385

Claims priority, application Japan, Oct. 18, 1977, 52-124887; Oct. 18, 1977, 52-124888

Int. Cl.³ H02P *5/28, 3/18, 5/34, 5/36*

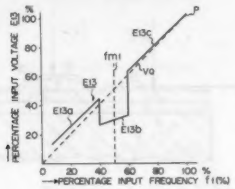
U.S. Cl. 318—808 **7 Claims**

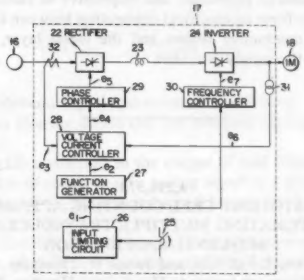
1. A speed control method for controlling the speed of an AC motor coupled with a load by supplying a variable voltage with a variable frequency to the AC motor comprising the steps of:

setting up at least two frequency regions for the variable frequency;

setting the ratio of a percentage input voltage expressed in terms of a percentage of the rated input voltage to the AC motor, to a corresponding percentage input frequency expressed in terms of a percentage of the rated input frequency

to the AC motor, less than unity within one of the frequency regions set in the first step, such that the high frequency torque ripple in said one of said set frequency regions is decreased; and





setting said ratio of percentage input voltage to percentage input frequency in at least a second frequency region to a ratio higher than that of said one of said frequency regions to increase motor torque in said second frequency region.

4,296,368

INTERNAL COMBUSTION ENGINE DRIVEN GENERATOR

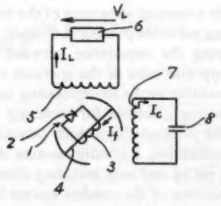
Masaaki Kubo, Sunto, Japan, assignor to Kokusan Denki Co., Ltd., Japan

Filed Oct. 22, 1979, Ser. No. 86,634

Claims priority, application Japan, Oct. 26, 1978, 53-147388[U]

Int. Cl.³ H02P 9/10

U.S. Cl. 322—75 **10 Claims**



1. An internal combustion engine driven generator in which a capacitor excitation type synchronous generator is driven by an internal combustion engine and has a parallel circuit of capacitor excitation winding means and capacitor means, said capacitor excitation winding means and said capacitor means providing sufficiently small ampere-turns of excitation so that, with a constant speed, the output voltage of the generator is decreased as the load current thereof decreases.

4,296,369

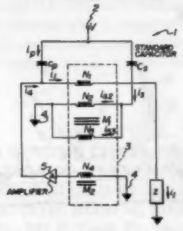
ACTIVE QUADRATURE CURRENT REFERENCE SOURCE

William J. M. Moore; Norbert L. Kusters, and Eddy So, all of Ottawa, Canada, assignors to Canadian Patents & Dev. Ltd., Ottawa, Canada

Filed Apr. 7, 1980, Ser. No. 138,179

Int. Cl.³ G05F 1/00; H01F 40/06

U.S. Cl. 323—218 **4 Claims**



1. A reference source comprising:

a reference capacitor C_s of high stability and purity and low capacitance for coupling to a voltage source;

a power capacitor C_p of high capacitance for coupling to the voltage source;

current comparator means coupled to the reference capacitor and the power capacitor for comparing currents through the capacitors C_s and C_p and for providing a difference signal; and

circuit means coupled to the current comparator means for generating a current in response to the difference signal and for adding the generated current to the current through the power capacitor to produce a combined output current having a waveform and phase identical to the current through the reference capacitor C_s.

4,296,370

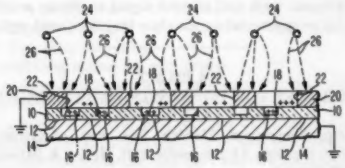
METHOD OF DETECTING A THIN INSULATING FILM OVER A CONDUCTOR

Robert B. Comizzoli, Belle Mead, and Robert D. Vibronek, Sayreville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 11, 1979, Ser. No. 83,640

Int. Cl.³ G01R 31/12, 31/26

U.S. Cl. 324—54 **8 Claims**



1. A method of detecting the presence of a thin insulating film having a thickness less than about 500 angstroms disposed over a surface of a conductor comprising the steps of:

positioning a conductive grid having openings therethrough adjacent the surface of said insulating film,

depositing through said openings in said grid ions of one type polarity adjacent said insulating film, said openings in said grid being sufficiently small to limit the surface charge voltage on said insulating film to less than the breakdown voltage of the thin insulating film, and

immersing said insulating film in a suspension of charged

particles having a polarity opposite to said one type, whereby the deposition of said charged particles adjacent said insulating film indicates the presence of said film.

4,296,371

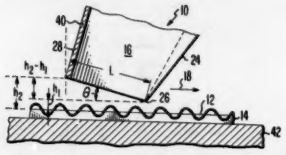
SYSTEM FOR MEASURING STYLUS SHOE LENGTH

Eugene O. Keizer, and Gerard A. Alphonse, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 131,044

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 R **23 Claims**



12. Apparatus for measuring shoe length of a stylus having a tip at one end thereof, said tip including a prow terminating at a base thereof and a stern remote from said prow, said tip adapted to track a path along a surface of an information record and to measure capacitive variations between said stylus and the surface of said record when relative motion is established between said stylus and said record, the shoe length being the distance between said base and said stern along a line tangent to said path at the tracking location, comprising:

means attached to said stylus for positioning the tip of said stylus adjacent the surface of a substrate to allow capacitive coupling, between said stylus and said substrate acting as capacitive electrodes, to produce an output signal at one capacitive electrode in response to an input signal at the other capacitive electrode,

means for changing the orientation of said stylus relative to said substrate an angle of θ degrees about an axis passing through the base of said prow in a direction parallel to the surface of said substrate and perpendicular to the direction of said shoe length, in order to change said orientation from a first position to a second position,

circuit means connected to the one capacitive electrode for measuring the amplitude of said output signal while said stylus and said substrate are oriented in said first and said second positions to obtain a first and a second signal respectively, and

means connected to said circuit means for comparing said first signal with said second signal to obtain a difference signal proportional to the shoe length of said stylus.

4,296,372

TECHNIQUES FOR IMPRESSING A VOLTAGE WITH AN ELECTRON BEAM

Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 23, 1979, Ser. No. 41,613

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824308

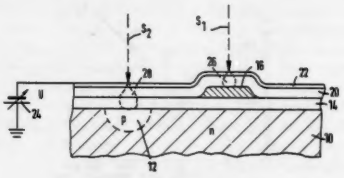
Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71 EB **6 Claims**

1. In an electrical device of the type which includes an electrically conductive region which is covered with an insulating material, and the insulating material is covered with a passivating material, the improvement therein for non-destructive testing of the electrical integrity of the electrically conductive region, comprising:

a metal layer carried on the passivating material over the electrically conductive region for connection to a supply potential,

said metal layer and the insulating material and the passivating material permeable and responsive to electron radiation to form an electrical connection between the electrically conductive region and the metal layer, and thus carry the supply potential.



4,296,373

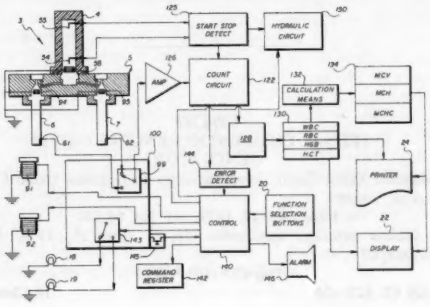
HEMATOLOGY CELL COUNTING APPARATUS INCORPORATING MULTIPLE TRANSDUCERS FOR SEQUENTIAL OPERATION

Henry R. Angel, Fairfield, and James W. Hennessy, Trumbull, both of Conn., assignors to Hycel, Inc., Houston, Tex.

Filed Jul. 12, 1979, Ser. No. 57,045

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71 CP **9 Claims**

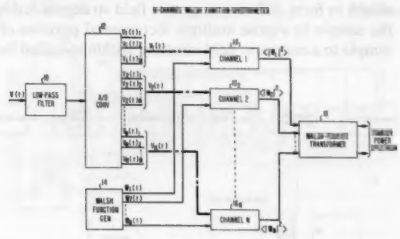


1. In a particle counting apparatus of the impedance sensing type for counting particles passing in a liquid through an aperture by measuring the impedance between inner and outer electrodes on opposite sides of the aperture in the liquid path, including a transducer probe incorporating said aperture and a volumetric metering chamber for metering a predetermined volume of liquid in connection with counting particles, the improvement comprising a conduit system disposed between said transducer probe and said metering chamber in the fluid path, the cross section of the conduit system being of a dimension such that bubbles which can be formed therein are small with respect to the predetermined volume of liquid to be metered by said volumetric metering chamber, and wherein said inner electrode comprises a first impedance measuring inner electrode on that side of the conduit system proximate said transducer probe and a second impedance measuring inner electrode disposed on that side of the conduit system proximate said volumetric metering chamber, said first and second inner electrodes being connected in parallel.

4,296,374
WIDEBAND DIGITAL SPECTROMETER

Paul S. Henry, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 11, 1979, Ser. No. 83,596
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 B **5 Claims**



1. A wideband digital spectrometer comprising:

low-pass filtering means (**10**) for low-pass filtering an input signal;

means (**12**) connected to the output of said filtering means capable of converting an analog signal to a plurality of N digital signals, each digital signal having M bits of resolution;

Walsh function generating means (**14**) for generating a plurality of N Walsh functions, each Walsh function being either $+1$ or -1;

means (**18**) capable of performing an $N \times N$ Walsh-Fourier power transformation

characterized in that

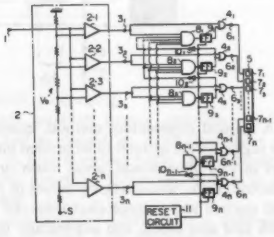
the wideband digital spectrometer further comprises

power spectrum generating means (**16**) connected to both the output of the analog-to-digital converting means (**12**) and the output of the Walsh function generating means (**14**) and capable of generating as an output a signal representative of a Walsh power spectrum of said analog-to-digital converting means, the output of said power spectrum generating means being connected to the input of the Walsh-Fourier power transformation means.

4,296,375
LEVEL INDICATOR FOR INDICATION OF MAXIMUM VALUES

Tsuneo Takezaki, Kadoma, Japan, assignor to Matsushita Electric Industrial Company, Kadoma, Japan

Filed Apr. 13, 1979, Ser. No. 29,714
Claims priority, application Japan, Apr. 14, 1978, 53/50086[U]
Int. Cl.³ G01R *19/04*
U.S. Cl. 324—103 P **15 Claims**



1. A level indicator system having a plurality of successively located luminous elements arranged to indicate the level of an input voltage by their respective location, comprising:

means for providing a plurality of graduated reference voltages;

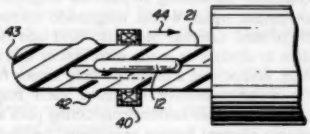
a plurality of comparators each associated with a respective luminous element, each comparator having a reference input terminal biased at a respective reference voltage and a signal input terminal responsive to said input voltage, each comparator deriving an output signal in response to the voltage at the signal input terminal thereof exceeding the reference voltage at said reference input terminal; and

a plurality of storage circuits each associated with a respective luminous element and a respective comparator and responsive to a respective comparator output signal for delivering an output signal to the associated luminous element.

4,296,376
PROBE FOR SENSING CHARACTERISTICS OF ELECTRICAL DEVICES UTILIZING A MAGNETIC SWITCH SENSOR BIASED BY AN ENCIRCLING MAGNETIC BIASING MEANS

Robert J. Bartol, Jr., 931 E. Tenth Pl., Mesa, Ariz. 85203

Continuation of Ser. No. 889,838, Mar. 24, 1978, abandoned. This application Jan. 29, 1979, Ser. No. 7,472
Int. Cl.³ G01N *27/72*; G01R *33/12, 19/14*
U.S. Cl. 324—235 **5 Claims**



1. A probe for sensing magnetic field characteristics generated by electric devices comprising in combination:

a non-magnetic housing,

a magnetizable switch forming a pair of contactable members mounted within said housing,

at least one of said members being movable in said housing relative to the other for engaging the other when in a magnetic field,

a lamp,

battery means having a pair of terminals,

a first means for connecting said lamp and said members in a series arrangement across the terminals of said battery means,

said members when exposed to a first magnetic field generated by an electric device deflecting relative to each other to engage to complete a circuit across said battery means to illuminate said lamp,

encapsulating means for said probe,

said encapsulating means comprising a first part forming a cylindrical configuration encasing said lamp and battery means and a second part forming an elongated constant diameter cylindrical projection of said first part and of a size reduced from said first part and containing said housing,

and

a magnetic means for mounting on and surrounding at least a part of said projection for producing a second constant magnetic field which passes substantially longitudinally through the axis of said switch to aid in closing said switch,

said magnetic means comprises a magnet in the shape of a toroid slidably mounted around and snugly fitting the periphery of said projection for increasing the sensitivity of said probe with the center of said magnet being substantially in longitudinal alignment with said members,

said magnet being movable along said projection and over said members to a given position causing engagement of said members and when moved from said position along said projection to another position opening said contacts.

4,296,377

MAGNETIC SIGNAL FIELD SENSOR THAT IS SUBSTANTIALLY IMMUNE TO ANGULAR DISPLACEMENT RELATIVE TO THE SIGNAL FIELD

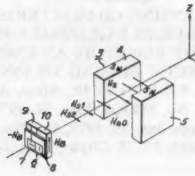
Hiroyuki Ohkubo, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1979, Ser. No. 23,270

Claims priority, application Japan, Mar. 27, 1978, 53-34095; Mar. 27, 1978, 53-34096; Jun. 20, 1978, 53-83573[U]

Int. Cl.³ G01R *33/06*

U.S. Cl. 324—252 **16 Claims**



1. Apparatus for sensing an external magnetic field to produce an output signal whose magnitude corresponds to the strength of said external magnetic field and is substantially insensitive to deviations in the direction of said external magnetic field, comprising a magnetic field sensor have only two coplanar magnetoresistive elements, each magnetoresistive element having a main current conducting path and each magnetoresistive element having anisotropic resistance as a function of the direction of the resultant magnetic field applied thereto, and bias means for supplying first and second equal bias magnetic fields to said first and second magnetoresistive elements, respectively, the intensity of the bias fields being sufficient to saturate said first and second magnetoresistive elements, said first bias magnetic field being supplied at an angle with respect to the first main current conducting path which differs from the angle at which said second bias magnetic field is supplied with respect to the second main current conducting path, said first and second magnetoresistive elements being connected in series with each other; said apparatus further comprising means for supplying a d.c. current to said series-connected first and second magnetoresistive elements; and means coupled to the junction defined by said series-connected first and second magnetoresistive elements to produce an output signal representing the magnitude of an external magnetic field as supplied to said first and second magnetoresistive elements, whereby said output signal is substantially immune to angular displacements of said magnetic field sensor relative to said external magnetic field.

4,296,378

APPARATUS PROVIDING ENHANCED DETECTION OF SPECIMENS IN INHOMOGENEOUS FIELDS

James D. King, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 5, 1979, Ser. No. 27,302

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—313 **18 Claims**

1. Improvements in a nuclear magnetic or electron spin resonance detection apparatus which tests a sample for the presence and quantity of nuclei of interest which apparatus forms a magnetic field on the sample and wherein a magnetic field intensity of a specified value coacts with a transmitted RF pulse of a specified shape and frequency in the sample, which apparatus includes

(a) a magnet control means;

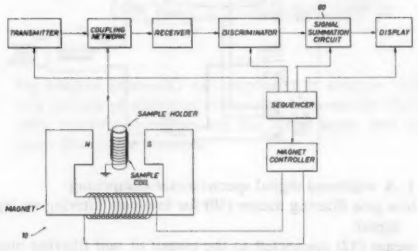
(b) an electromagnet operated by said control means;

(c) a pulsed RF transmitter operable to form an RF pulse of a specified pulse shape and frequency;

(d) a receiver positioned to receive an RF signal from the sample as a result of the transmitted RF pulse;

wherein the improvement comprises:

(1) first means for selectively operating the magnet control means to form different magnetic field strengths acting on the sample to expose multiple incremental portions of the sample to a magnetic field intensity within specified limits;



(2) timing means for controllably operating the transmitter to form repetitively transmitted pulses for the sample which pulses are transmitted into the sample synchronized with the operation of said first means; and

(3) summing means connected to the receiver for summing repetitively formed received signals from the sample, said summing means summing the received signals after synchronization thereof relative to the relative occurrence of the transmitted RF signals.

4,296,379

GROUND PROSPECTING METHOD UTILIZING ELECTRICAL RESISTIVITY MEASUREMENTS FOR MEASURING THE RESISTIVITY OF UNIT BLOCKS OF THE GROUND

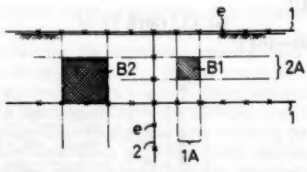
Eizaburo Yoshizumi, 402 Manhegm Kamogawa, 14 Yoshida Kawara-machi, Sakyo-ku Kyoto-shi, Kyoto-fu, Japan

Filed Aug. 23, 1978, Ser. No. 936,057

Claims priority, application Japan, Aug. 25, 1977, 52-102040; Dec. 26, 1977, 52-156766; Dec. 27, 1977, 52-159646; Apr. 17, 1978, 53-44932

Int. Cl.³ G01V *3/02*

U.S. Cl. 324—357 **7 Claims**

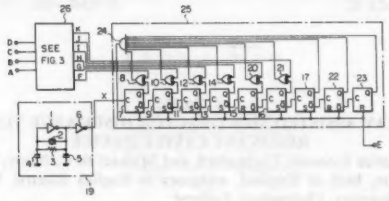


1. A ground prospecting method, comprising dividing the entire region of the ground to be probed into a plurality of unit blocks in two-dimensional, areal, form or three-dimensional, volumetric, form, measuring by means of a plurality of sets of spaced current and voltage electrodes the apparent resistivity of each said unit block, and analytically determining the true resistivity of each said unit block from said measured apparent resistivity thereof to ascertain the condition of said ground region.

4,296,380
PROGRAMMABLE DIGITAL FREQUENCY DIVIDER FOR SYNTHESIZING SIGNALS AT DESIRED FREQUENCY

Hiroshi Minakuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Osaka, Japan

Filed May 21, 1979, Ser. No. 40,618
Int. Cl.³ H03K 21/34; H03L 7/18
U.S. Cl. 328—48 22 Claims

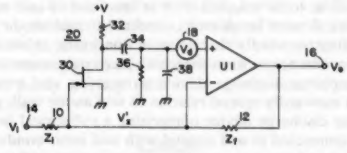


1. A programmable digital frequency divider comprising:
a programmable binary counter respective of input pulses from a pulse source and having a plurality of control terminals for generating output pulses at a frequency variable in accordance with a set of binary states of said control terminals; and
a binary code converter comprising a plurality of input terminals to which is applied an M-bit input binary signal, a plurality of output terminals connected to said control terminals of said programmable counter, and a logic circuit connected between said input and output terminals for converting said M-bit input binary signal into an N-bit output binary signal for application to said output terminals, where N equals an integral multiple of M minus an error compensating number which causes the frequency of said output pulses to vary substantially linearly as a function of discrete variations of said input binary signal.

4,296,381
DISTORTION REDUCTION CIRCUIT FOR AN INVERTING FEEDBACK AMPLIFIER

Bruce E. Hofer, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 1, 1979, Ser. No. 80,711
Int. Cl.³ H03D 1/00
U.S. Cl. 330—149 3 Claims

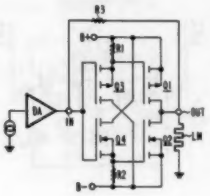


1. An amplifier circuit, comprising:
an inverting feedback amplifier having inverting and non-inverting inputs and an output, an input impedance element connected to said inverting input, and a feedback impedance element connected from said output to said inverting input; and
a distortion reduction amplifier comprising a field-effect transistor, the gate of which is directly connected to said inverting input of said feedback amplifier, and the drain of which is coupled to said non-inverting input of said feedback amplifier.

4,296,382
CLASS AB PUSH-PULL FET AMPLIFIERS

Merle V. Hoover, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,027
Int. Cl.³ H03F 3/30
U.S. Cl. 330—264 21 Claims

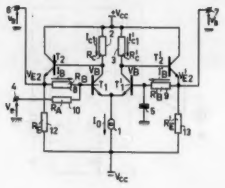


1. A Class AB quasi-linear push-pull amplifier comprising:
first and second supply terminals for receiving a relatively positive operating voltage and a relatively negative operating voltage respectively;
input and output signal terminals;
a p-channel, field-effect output transistor with a source electrode connected at said first supply terminal, with a drain electrode connected at said output signal terminal, and with a gate electrode;
an n-channel, field-effect output transistor with a source electrode connected at said second supply terminal, with a drain electrode connected at said output signal terminal, and with a gate electrode;
first potential translating means for maintaining a positive direct offset potential between said input signal terminal and the gate electrode of said p-channel output transistor during quiescent conditions and during positive excursions of input signal, which means includes a p-channel, field-effect source-follower transistor having the potential at said signal input terminal applied without translation to its gate electrode, and
a number N, at least one, of first forward-poled field-effect transistors having gate-source paths connected between the source electrode of said p-channel source-follower transistor and the gate electrode of said p-channel output transistor;
second potential translating means for maintaining a negative direct offset potential between said input signal terminal and the gate electrode of said n-channel output transistor during quiescent conditions and during negative excursions of input signal, which means includes an n-channel, field-effect source-follower transistor having the potential at said input signal terminal applied without translation to its gate electrode, and
a number N, of second forward-poled field-effect transistors having gate-source paths connected between the source electrode said n-channel source-follower transistor and the gate electrode of said n-channel output transistor;
means for maintaining the quiescent potential at said input signal terminal at a potential between said relatively positive and relatively negative operating voltages, which means includes:
a direct-coupled feedback connection from said output signal terminal to said input signal terminal;
pull-up means for pulling up the potential at the gate electrode of said p-channel output transistor during substantially positive excursions of input signal; and
pull-down means for pulling down the potential at the gate electrode of said n-channel output transistor during substantially negative excursions of input signal.

4,296,383
BALANCING AMPLIFIER

Jean-Louis Jeandot, Paris, and Emmanuel Lefort, L'Hay-les-Roses, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Apr. 19, 1979, Ser. No. 31,648
Claims priority, application France, May 16, 1978, 78 14397
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—301 **20 Claims**

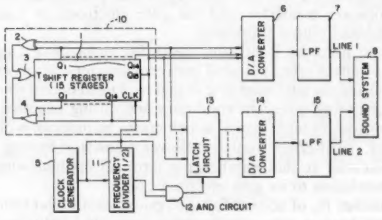


1. A balancing amplifier comprising a single input terminal for connection to a signal to be balanced, a pair of transistors connected as a differential amplifier with a control electrode of one transistor of the differential amplifier coupled to said input terminal via an input impedance element, each of the transistors hving a load circuit provided with a transistor arranged as a voltage follower for supplying, by means of a negative feedback network, a negative feedback voltage to the control electrode of the transistor of the differential amplifier to which the network is connected in response to a signal at the input terminal.

4,296,384
NOISE GENERATOR

Toshio Mishima, Kitamoto, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Sep. 17, 1979, Ser. No. 76,083
Claims priority, application Japan, Sep. 20, 1978, 53-115393; Sep. 20, 1978, 53-115394
Int. Cl.³ H03B *29/00*
U.S. Cl. 331—78 **2 Claims**



1. A band noise generator comprising:

a clock means producing a predetermined clock output,

a random pulse generator for generating random pulses in synchronism with said clock output and for separating multistage parallel outputs into integer and decimal bits for output;

a band width designating circuit for designating a predetermined noise band width and reading therefrom, by the integer bits, a frequency coefficient represented by an integer corresponding to the designated noise band width;

a memory circuit for storing a fundamental frequency coefficient represented by an integer;

an adder for adding together the frequency coefficient read from the band width designating circuit and the fundamental frequency coefficient from the memory circuit to output predetermined output bits;

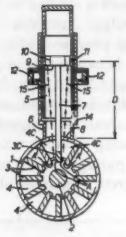
an accumulator for adding the decimal bits from the random pulse generator to the output bits from the adder and accumulating them in synchronism with the clock to output predetermined high-order bits; and

a sine-wave table for reading therefrom a sine wave in accordance with the output content of the accumulator.

4,296,385
X-RAY ASSISTED MULTIPACTOR DISCHARGE TUNED RESONANT CAVITY DEVICE

Maurice Esterson, Chelmsford, and Michael B. C. Brady, Maldon, both of England, assignors to English Electric Valve Company, Chelmsford, England

Continuation of Ser. No. 12,725, Feb. 16, 1979, abandoned, which is a continuation of Ser. No. 734,882, Oct. 22, 1976, abandoned. This application Feb. 25, 1980, Ser. No. 124,126
Claims priority, application United Kingdom, Oct. 24, 1975, 43705/75
Int. Cl.³ H01P *1/14*; H03B *9/10*
U.S. Cl. 331—90 **3 Claims**



1. A multipactor tuned magnetron oscillator comprising an anode body having a generally cylindrical anode wall, a cathode disposed substantially concentrically within said anode wall, a plurality of vanes within said anode body and defining a plurality of resonant cavities therewithin, at least some of said vanes extending radially inwardly from said anode wall toward said cathode, said anode wall having an opening therein, an inner conductor extending substantially centrally through said opening and substantially radially into and out of said anode body so as to be coupled with at least one of said cavities, a cylindrical outer conductor connected to said anode wall and extending outwardly thereform in concentric relation to said inner conductor to form therewith a coaxial transmission line, a multipactor discharge device terminating said transmission line in outwardly spaced relation to said anode wall, said multipactor discharge device comprising a cylindrical inner electrode connected to and coaxial with said inner conductor and a cylindrical outer electrode concentric with said inner electrode and connected to said outer conductor, the inner and outer electrodes presenting mutually opposed and concentrically spaced surfaces which define a multipactor discharge gap, each of said vanes terminating in spaced relation to said cathode and defining a tip at which X-rays are generated during operation of the oscillator, and said opening having a diameter which is sufficiently large and said multipactor discharge gap surfaces being sufficiently spaced whereby generated X-rays pass in straight line fashion through said opening and into said discharge gap to directly irradiate at least one of said discharge gap surfaces sufficiently to cause emission of photoelectrons which enhance the starting of multipactor discharge between said gap surfaces.

4,296,386
SEMICONDUCTOR INJECTION LASER HAVING A MOVABLE LASER BEAM

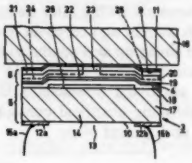
Rudolf P. Tijburg; Peter J. de Waard, and Teunis van Dongen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,606

Claims priority, application Netherlands, Feb. 2, 1978, 7801181

Int. Cl.³ H01S *3/19*

U.S. Cl. 331—94.5 H **20 Claims**



1. An injection laser which comprises:

a semiconductor body having two semiconductor regions of opposite type conductivities which form an injecting p-n junction in the semiconductor body, the semiconductor body having two oppositely-located side surfaces substantially perpendicular to said p-n junction which form an optical resonator therebetween and two oppositely-located major surfaces substantially parallel to said p-n junction;

a first contact region provided on one of said two major surfaces and a second contact region provided on the other of said major surfaces for passing a current across the p-n junction, one of said contact regions being divided into two sub-contact regions so that the current distribution across the p-n junction can be controlled by controlling the current distribution between said two sub-contact regions; and

means for forming an active zone at least partly adjoining said p-n junction which can be moved in a direction transverse to that of the laser beam by controlling the current distribution between said two sub-contact regions in a plane substantially parallel to that of the p-n junction, the two sub-contact regions being separated from each other by a gap which extends substantially in the same direction as the laser beam, said other contact region extending over its major surface across the area of the perpendicular projection of said gap onto the major surface of the other contact region, and the region of the semiconductor body between said sub-contact regions having a sufficiently high resistance such that a plurality of current paths are defined in said body from said two sub-contact regions and converging to said other contact region and which at least partly overlap each other at the area of said p-n junction.

4,296,387
SEMICONDUCTOR LASER

Takashi Sugino, Takatsuki, and Kunio Itoh, Uji, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

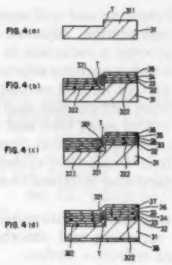
Filed May 18, 1979, Ser. No. 40,182

Claims priority, application Japan, May 22, 1978, 53-61205; Jun. 7, 1978, 53-69362; Jun. 7, 1978, 53-69363; Jun. 7, 1978, 53-69364; Jun. 8, 1978, 53-69572; Dec. 18, 1978, 53-156621

Int. Cl.³ H01S *3/19*

U.S. Cl. 331—94.5 H **10 Claims**

1. In a semiconductor laser of multi-layer heretostructure, an active layer epitaxially formed on a cladding layer on a substrate, a first ohmic contact electrode which is stripe shaped and disposed above said active layer, and a second ohmic contact electrode disposed under and contacting said substrate, said substrate having a terraced structure with a step part on its principle face, said active layer having a stripe shaped active



region disposed oblique to said principle face between upper and lower parts which are horizontal to said principle face, with upper and lower bent parts disposed respectively between.

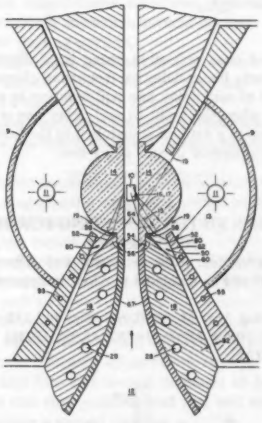
4,296,388
THERMALLY IMPROVED DYE LASER FLOW CHANNEL

Vaughn G. Draggoo, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Oct. 29, 1979, Ser. No. 88,775

Int. Cl.³ H01S *3/08*

U.S. Cl. 331—94.5 L **16 Claims**



1. In a fluid laser comprising:

a channel having a flow therethrough of a laseable fluid;

a conduit for a flow of said fluid upstream of said channel;

an optically transparent window in optical communication with said laseable fluid and having a first interface therewith, said window having a second interface with an ambient atmosphere disposed externally of said channel;

means disposed externally of said channel and in optical communication with said window for exciting said laseable fluid in said channel by the transmission of light thereto through said window to cause laser radiation including fluorescent radiation to be produced in a region of said channel; and

at least one wall member partially defining said upstream

conduit for the flow of said fluid upstream of said channel, portions of said wall member being adjacent a perimeter of said window and being in sealing engagement therewith;

means for reducing heat absorbed by said wall member comprising:

a bevelled surface formed on said wall member externally of said conduit on said portions adjacent said perimeter of said window to provide a reduction in transverse thickness in said wall member portions adjacent said perimeter;

a highly reflective surface formed on said bevelled surface and facing away from said channel, said reflective surface being adapted to reflect away from said wall member said light and said fluorescent radiation directed theretoward and emanating from within said channel and said light directed theretoward and reflected from said first interface;

means in a confronting spaced relationship with said reflective surface for receiving and absorbing light energy reflected from said reflective surface.

4,296,389

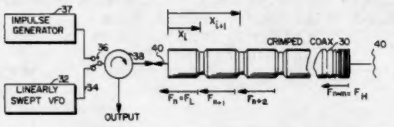
CRIMPED COAX REFLECTIVE DISPERSIVE DELAY LINE

Harrison W. Fuller, Lexington, Mass., and Chester E. Stromswold, Nashau, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed May 14, 1979, Ser. No. 39,229

Int. Cl.³ H01P *1/202, 3/06, 9/00, 11/00*

U.S. Cl. 333—160 **12 Claims**



1. A crimped coax reflective broad band dispersive delay line with precisely linear delay vs. frequency characteristics so that the output of said delay line will function as a pulse compression filter when the input to said delay line is linearly fm frequency swept in a manner is matched to the linear delay vs. frequency characteristic of said delay line.

4,296,390

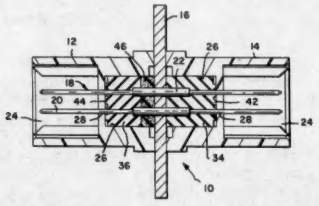
SOLDERLESS FILTER MOUNTING FOR HEADER ASSEMBLIES

Eric E. Vanderheyden, Hummelstown, and Albert Casciotti, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 21, 1980, Ser. No. 142,535

Int. Cl.³ H01R *19/06, 19/10, 13/66;* **H03H** *7/01*

U.S. Cl. 333—182 **11 Claims**



1. A filtered header or feedthrough connector comprising:

a ground plane;

a pair of hermaphroditic housing members of insulative material each having a planar first mating face and a profiled second mating face, a recess in each said planar face, said recesses together defining a cavity, and a plurality of terminal bores each extending from said second faces to said cavity, said housing members adapted to be mounted by their first mating faces on opposite sides of said ground plane;

a rubber block in each said cavity, each said block having a plurality of apertures therein, each aligned with a respective terminal bore in said housing members;

a conductive rubber gasket in one cavity held in compression between said first mating face and said ground plane and having a like plurality of apertures therein; and

a plurality of filtered terminal assemblies each including an elongated terminal with a filter sleeve secured intermediate the ends thereof and received in said blocks with the filter sleeve engaging said conductive gasket and the ends of the terminal projecting from said second mating faces to engage associated terminals, said conductive rubber gasket establishing electrical contact between said filter sleeve and said ground plane.

4,296,391

SURFACE-ACOUSTIC-WAVE FILTER FOR CHANNEL SELECTION SYSTEM OF TELEVISION RECEIVER

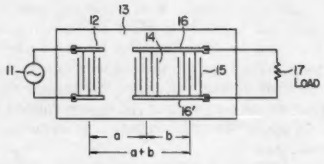
Katashi Hazama, Zushi, and Akitsuna Yuhara, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1978, Ser. No. 954,124

Claims priority, application Japan, Oct. 28, 1977, 52-128699; Oct. 28, 1977, 52-128700

Int. Cl.³ H03H *9/64, 9/68*

U.S. Cl. 333—193 **12 Claims**



1. A surface-acoustic-wave filter for a channel selection tuning system comprising:

a piezoelectric substrate;

a plurality of surface-acoustic-wave comb filter means provided integrally on a surface of said substrate and exhibiting as a whole a comb frequency characteristic which corresponds to a channel frequency distribution for a plurality of channel bands corresponding to different programs over a wide channel range, each surface-acoustic-wave comb filter means comprising:

an input transducer for converting a local oscillator output of a corresponding channel band into an acoustic surface wave;

first and second output transducers electrically connected and physically spaced for converting surface acoustic waves from the input transducer into electric signals, said first and second output transducers being located along a surface-acoustic-wave propagation path on the substrate with different distances from and on the same side of said input transducer, the respective spacings of said first and second output transducers from said input transducer being such that the reciprocal of a differential delay time between the output electrical signals from said first and second output transducers is equal to a divisor of a channel spacing in the corresponding channel band;

input and output terminal means coupled on the substrate for connecting at least two of said filter means in parallel, said output terminal means being directly coupled with said first and second output transducers to provide a sum of

outputs of the first and second output transducers as the output of the comb filter.

4,296,392

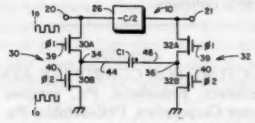
SWITCHED CAPACITOR BILINEAR RESISTORS

Man S. Lee, Belmont, Calif., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Jun. 30, 1980, Ser. No. 164,394

Int. Cl.³ H03H *11/46*

U.S. Cl. 333—213 **24 Claims**



1. An integratable switched capacitor circuit for simulating a resistor comprising:

first and second nodes;

a capacitor having a pair of terminals;

first means for effectively establishing a negative capacitance between a pair of terminals thereof;

second means connecting associated ones of said terminals of said first means to said first and second nodes, respectively;

third means for periodically connecting one side of said capacitor to ground and to one of said nodes at a prescribed switching frequency so as to simulate a resistor across said nodes.

4,296,393

CONTACT SPRING ARRANGEMENT FOR AN ELECTROMAGNETIC RELAY

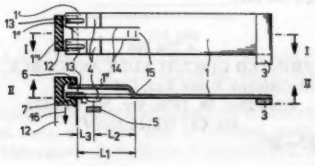
Hans Sauer, Fichtenstrasse 5, Deisenhofen, Fed. Rep. of Germany (D-8024); Wolf Steinbichler, Am Hoehenpark, Bad Feilnbach, Fed. Rep. of Germany (D-8201), and Sepp Antonitsch, Holzham 2d, Otterfing, Fed. Rep. of Germany (D-8156)

Filed Jan. 24, 1980, Ser. No. 115,093

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902885

Int. Cl.³ H01H *67/02*

U.S. Cl. 335—125 **13 Claims**



1. A contact spring arrangement for an electromagnetic relay including

(a) a contact spring mounted on a terminal and having at least one portion serving as a movable contact cooperating with a fixed contact, and

(b) an actuator engaging the contact spring and having a first actuator portion for moving the movable contact towards the fixed contact and a second actuator portion for withdrawing the movable contact from the fixed contact,

(c) a first distance between the location at which the first actuator portion engages the contact spring and the contacting location of the movable and fixed contacts being greater than a second distance between the location at which the second actuator portion engages the contact spring and said contacting location.

4,296,394

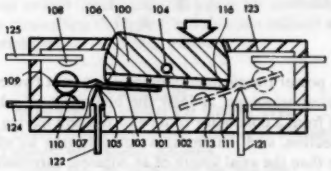
MAGNETIC SWITCHING DEVICE FOR CONTACT-DEPENDENT AND CONTACTLESS SWITCHING

A. Kadry Ragheb, 100 Francois, Montreal, Quebec, Canada

Filed Feb. 13, 1978, Ser. No. 870,846

Int. Cl.³ H01H *36/00*

U.S. Cl. 335—207 **72 Claims**



1. A magnetic switch comprising:

a. a switch mounting structure,

b. a first driver member comprising:

1. a first mounting portion by which said first member is moveably mounted relative to said switch structure,

2. a first magnetically attractive portion having a first magnetically attractive surface portion,

3. a first bearing portion,

c. mounting means, attached to said switch structure, providing support for the movement of said first member,

d. a second slave member comprising:

1. a second mounting portion by which said second member is moveably mounted relative to said switch structure,

2. a second magnetically attractive portion having a second magnetically attractive surface portion,

3. a second bearing portion,

e. first pivot means, attached to said switch structure, providing support for the movement of said second member,

f. first stop means, mounted to said switch structure, located in the path of travel of said second member,

g. said first and second members having a first position where the first and second magnetically attractive surface portions are located adjacent one another in a manner to cause said first and second members to be magnetically held in said first position, said first and second members also having a second position,

h. said first member being moveable by an applied force to said second position in a manner causing the said first bearing portion to engage the said second bearing portion, the resulting engaged movement further causing a corresponding movement of said second member to said second position wherein said second member makes contact with said first stop means, said engaged movement further causing said first and second magnetically attractive surface portions to become spaced from one another by an air gap,

i. at least one of said first and second members being mounted for angular movement relative to said switch structure in a manner that said first and second members move angularly relative to one another.

4,296,395

STRUCTURE FOR PREVENTING WINDING COLLAPSE

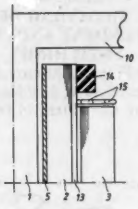
Bertil Moritz, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Nov. 2, 1979, Ser. No. 90,699

Claims priority, application Sweden, Nov. 9, 1978, 7811561; Feb. 28, 1979, 7901797

Int. Cl.³ H01F *27/08, 27/30*

U.S. Cl. 336—60 **13 Claims**



1. A power transformer comprising at least two concentric, cylindrical windings, at least the innermost of which being wound from a conductor of tape or foil and having a circular cross-section, said innermost winding having an axial length greater than the axial length of an adjacent surrounding winding, an inner supporting cylinder made of metallic material for supporting said innermost winding, said inner supporting cylinder including a longitudinally extending, electrically insulating slot, and ring girders surrounding the ends of said innermost winding, said innermost winding being supported against said an adjacent surrounding winding and against said ring girders.

4,296,396

MANUAL ELECTRIC SWITCH WITH THERMAL RELEASE

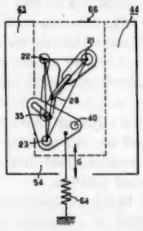
Raymond A. Ingrain, Quetigny, and Jacques Cohen, Fontaine, both of France, assignors to La Telemecanique Electrique, France

Filed Jan. 29, 1980, Ser. No. 116,508

Claims priority, application France, Jan. 31, 1979, 79 02479

Int. Cl.³ H01H *71/16*

U.S. Cl. 337—66 **6 Claims**



1. In a switch, with manual closing and opening and with thermal release, having a housing, an operating member in the housing and coupled to a control arm which is movable about a first fixed pivot and an end of which is coupled by a first articulation to a first end of a connecting rod to constitute a knee joint, a second end of said connecting rod being coupled by a second articulation to a loading lever, a first end of which loading lever is abutted on a latch displaced rotatably about a second fixed pivot, by the movement of overload bi-metallic strips, and a second end of which loading lever cooperates with a transmission lever which is associated with movable contacts, and which pivots about a third pivot, the improvement that:

(i) the first pivot and the second pivot are disposed in the proximity of an upper part of said housing near to said operating member,

(ii) said third pivot is fixed and disposed at the lower part,

(iii) said three pivots are placed substantially at the apices of a right-angled triangle, and

(iv) said second and third pivots are placed on a straight line substantially parallel to the direction of movement of said operating member and to the direction of movement of said movable contacts.

4,296,397

FUSE STRUCTURE FOR CORROSIVE ATMOSPHERE

Donald C. Sedberry, Erdenheim, Pa., assignor to Welsbach Ozone Systems Corporation, Philadelphia, Pa.

Filed May 30, 1980, Ser. No. 155,799

Int. Cl.³ H01H *1/06*

U.S. Cl. 337—199 **12 Claims**

1. A fuse structure for use with ozonators and corrosive atmosphere applications comprising:

a fine ozone corrosion resistant fuse wire;

conductive terminal means to which the fuse wire is conductively attached and which in turn enable fuse connection into a circuit;

rigid insulator spacing means engaging and spacing the terminal means so that the fuse wire is extended and so that the structure constitutes a unitary structure which may be handled as a unit; and

insulator shield means placed over the fuse wire over a substantial portion of its length and serving to shield the insulator spacing means from vaporized filament material when the fuse opens in order to avoid a conductive path being formed by vaporized fuse metal condensing on the insulator through which an alternate electrical path exists through the fuse.

4,296,398

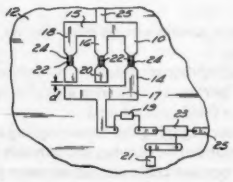
PRINTED CIRCUIT FUSE ASSEMBLY

James D. McGalliard, Santa Ana, Calif.

Filed Dec. 18, 1978, Ser. No. 970,632

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—297 **1 Claim**



1. A printed circuit, including multiple printed circuit fuse elements, comprising:

a circuit substrate;

a printed circuit formed on said substrate for interconnecting

circuit components, said printed circuit including a circuit bus;

a first printed circuit fuse element formed on said substrate, interconnected to limit the current in said printed circuit to protect said printed circuit from abnormally high currents, said first printed circuit fuse element having a predetermined current capacity which is lower than the current capacity of the conductors of said printed circuit which are connected to said first printed circuit fuse element; and

a second printed circuit fuse element on said substrate, having a solder land adjacent said circuit bus, said land separated from said bus sufficiently to electrically isolate said land from said bus, but spaced close enough to said bus to permit molten solder to be applied as a jumper from said land to said bus, said second printed fuse element, when solder is applied connecting said land to said bus, being in parallel circuit connection with said first printed circuit fuse element.

4,296,399

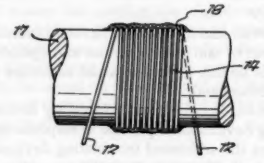
MICROMINIATURE PALLADIUM OXIDE GAS DETECTOR AND METHOD OF MAKING SAME

Frank T. John, Williamsville, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Division of Ser. No. 862,974, Dec. 21, 1977, Pat. No. 4,193,964. This application Aug. 6, 1979, Ser. No. 64,020

Int. Cl.³ H01L *17/04, 7/00*

U.S. Cl. 338—34 **2 Claims**



1. A method for making a miniature platinum or palladium wire coil comprising winding a wire having a diameter of from about 0.0001 cm to about 0.005 cm about a mandrel, said mandrel being made of a material which can be removed by oxidation without oxidizing said wire; coating the wire wound about said mandrel with a ceramic precursor; drying and curing the ceramic precursor to form a ceramic binder and removing said mandrel by oxidation, said precursor comprising aluminum phosphate, phosphoric acid, chromium phosphate, submicron aluminum oxide and water.

4,296,400

INSTALLATION FOR CONTROL OF A TRAFFIC LIGHT SYSTEM BY VEHICLES HAVING AN AUTOMATIC LOCATION DETERMINATION

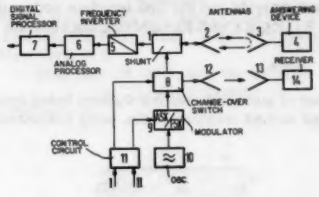
Becker Friedbert; Johann Steinkamp, both of Munich, and Klaus Koenen, Berg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 28, 1978, Ser. No. 964,431

Int. Cl.³ G08G *1/07*

U.S. Cl. 340—32 **2 Claims**

1. In an installation for the control of a traffic light system from a vehicle, the combination of means carried by the vehicle for supplying information for automatic determination of position, i.e. bearing determination, a first directional antenna for transmission/reception, carried by the vehicle for transmission of such bearing information and having its transmission direction oriented essentially perpendicular to the direction of travel of the vehicle, a second directional antenna carried by the vehicle and oriented in the direction of travel of the vehicle for transmission of transfer messages or commands for the control of lights of such a traffic light system, means for producing carrier waves, means for modulating said carrier waves, said means for modulating is adapted to provide two types of modulated signals which are orthogonal to one another, one for the modulation of bearing information and the other for the modulation of transfer messages or commands, change-over switch means selectively connecting said means



for modulating to said first antenna over a shunt means or to said second antenna, and control means connected to said change-over switch means and said means for modulating for selectively controlling the type of modulation utilized and the antenna employed for a selected transmission.

4,296,401

INDUCTIVE VEHICLE DETECTOR

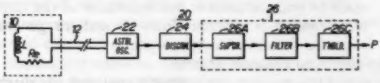
Richard K. Duley, Romsey, England, assignor to Redland Automation Limited, Winchester, England

Filed Jan. 10, 1978, Ser. No. 868,240

Claims priority, application United Kingdom, Jan. 11, 1977, 1029/77

Int. Cl.³ G08G *1/01*

U.S. Cl. 340—38 L **14 Claims**



1. A vehicle detector circuit for use with an inductive detector loop for sensing the presence of a vehicle in the vicinity of the loop, comprising:

first means connectable to an inductive detector loop to impress on the loop a voltage of predetermined waveform including a discontinuity and produce therein a current whose relationship to the impressed voltage is essentially determined by the inductive time constant of the loop;

second means responsive to the current in the loop and having a non-resonant response to provide a signal having the waveform of the current in the loop;

comparator means responsive to said voltage waveform and to said current waveform signal to provide a signal dependent on the lag of the current waveform with respect to said discontinuity of the voltage waveform due to the inductive time constant of the loop circuit; and

analyzer means responsive to changes in said lag-dependent signal to provide an output signal indicative of the presence of a vehicle in the vicinity of the detector loop.

4,296,402

VEHICLE ANTI-THEFT DEVICE

Slawomir Z. Szczepanski, 5455 N. Sheridan Rd., Chicago, Ill. 60640

Filed Apr. 2, 1980, Ser. No. 136,412

Int. Cl.³ B60R *25/04*

U.S. Cl. 340—64 **15 Claims**

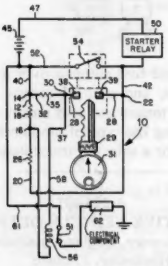
1. An anti-theft device for a motor vehicle having an electrical system including a starter relay, said device comprising:

a four-node electrical network including a first resistive segment having a predetermined resistance R_1 between a first interface node and a first intermediate node, a second

resistive segment having a predetermined resistance R_2 between the first intermediate node and a second interface node, a third resistive segment having a predetermined resistance R_3 between the second interface node and a second intermediate node, a fourth resistive segment having a predetermined resistance R_4 between the second intermediate node and the first interface node, said resistances R_1, R_2, R_3, and R_4 satisfying the equation

$$R_1R_3=R_2R_4$$

at least a part of said third resistive segment being removable, said first and second interface nodes being connected to the



electrical system of the motor vehicle such that a voltage differential is created between the first and the second interface nodes when the electrical system is activated;

means for detecting an imbalance in an electrical property between said first intermediate node and said second intermediate node whenever the resistance of the third resistive segment is different from R_3 and for generating in response thereto an output signal;

an electrical component; and

means for receiving the output signal and for disabling in response thereto said electrical component, said component selected such that means for receiving and disabling does not prevent normal operation of the starter relay but prevents operation of the engine.

4,296,403

METHOD AND CIRCUIT ARRANGEMENT FOR SWITCHING AND TRANSMITTING SIGNALS IN, OR FROM, A STORED PROGRAM CONTROLLED SWITCHING SYSTEM

Eckhart Haensel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,387

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853138

Int. Cl.³ H04Q *3/00*

U.S. Cl. 340—147 P **3 Claims**

1. A circuit arrangement for switching and emitting signals in or from, respectively, a stored program controlled switching system having a plurality of addressable feeder channels supplying signals in the incoming transmission direction and a plurality of like-addressed receiving channels for feeding signals out in the outgoing direction, comprising:

a stored program controlled switching system connected to the plurality of feeder channels which supply signals in the incoming transmission direction and to the plurality of receiving channels which feed signals in the outgoing transmission direction;

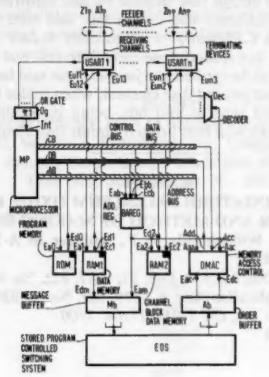
control means including programs stored therein for determining the processing steps to be executed;

said control means including a memory storing the processing programs;

an addressing device connected to said memory for receiving addresses and emitting a channel address designating a feeder channel and a receiving channel for the duration of the handling of the processing program relating thereto;

a control device including a control input, said control input connected to said addressing device for feeding addresses thereto;

a plurality of terminating devices connected to the feeder channels for receiving and recognizing the occurrence of



signals therein, said terminating devices connected to said control input of said control device and operable to cause said control device to feed channel addresses to said addressing device; and

means connected between said addressing device and said terminating devices and operable in response to addresses to condition the addressed terminating devices for transmission in both directions over the respective addressed channels.

4,296,404

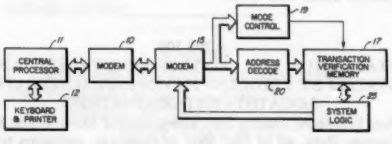
REMOTE VERIFICATION LOCKOUT SYSTEM

James R. Sheldon, Phoenix, Ariz., assignor to Engineered Systems, Inc., Tempe, Ariz.

Filed Oct. 18, 1979, Ser. No. 85,895

Int. Cl.³ G06K *5/00*; H04Q *3/02*

U.S. Cl. 340—149 A **5 Claims**



1. A system for providing a verification check of uniquely encoded multibit binary words at a plurality of remote locations, the system having a central station for supplying address signals and verification "valid/non-valid" control signals through a transmission link interconnecting said central station with each of said plurality of remote locations, each of said remote locations including in combination:

read/write memory means having a plurality of address locations therein, each address location storing a single binary bit indicative of the "valid/non-valid" status of the item represented by each such address location, said memory means further having a single output on which an output signal is produced corresponding to the binary bit stored at the address location selected in said memory means;

lockout utilization means coupled to the output of said mem-

ory means and operated in response to output signals appearing thereon;

address control means operated in response to addressing signals and coupled to said memory means for selecting particular address locations for the writing of bits into and the reading of bits from those address locations of said memory means;

read/write control means coupled to said memory means and further coupled with said transmission link and responsive to signals applied thereto from said central station over said transmission link for controlling the read/-write mode of operation of said memory means and for supplying said verification control signals to said memory means to selectively change the "valid/non-valid" status of the binary bits stored in said memory means when said memory means is in the write mode of operation;

gating circuit means having a plurality of inputs and having outputs coupled with said address control means for supplying said addressing signals thereto;

address decoding means coupled to selected inputs of said gating circuit means and further coupled with said transmission link and responsive to address signals supplied thereto from said central station over said transmission link for supplying address input signals to said gating circuit means;

further circuit means coupled to others of the inputs of said gating circuit means for supplying input addressing signals thereto; and

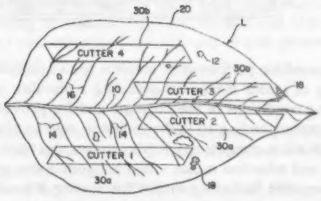
selecting means coupled with said read/write control means and operated thereby and further coupled to said gating circuit means for causing the signals appearing on the outputs of said gating circuit means to be selected from the input signals from said address decoding means or the input signals from said further circuit means, thereby causing the signal on the output of said memory means to correspond to the binary bit stored at the address location selected by the addressing signals from said gating circuit means.

4,296,405

DEVICE FOR CONVERTING ANALOG SIGNALS FROM A NATURAL LEAF SCANNER INTO DIGITAL SIGNALS AND METHOD OF OPERATING SAME

Leonard G. Rich, West Hartford, Conn., assignor to Gulf & Western Corporation, New York, N.Y.

Filed May 2, 1978, Ser. No. 902,253
Int. Cl.³ G06K *9/00;* A24C *1/00*
U.S. Cl. 340—146.3 AG **9 Claims**



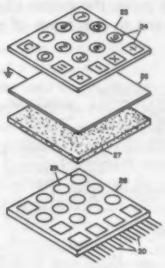
1. A device for converting a succession of analog voltage signals representative of the light intensity of light from and controlled by a corresponding succession of finite surface locations of a natural leaf into a white, black or gray digital signal for each given location, said device comprising: means for creating a white digital signal when an analog voltage signal at a given location exceeds a first threshold voltage corresponding to a given light intensity value; means for creating a black digital signal when an analog voltage signal at a given location is below a second threshold voltage; averaging means for creating said second threshold voltage by averaging at least a majority of previous analog signals of said succession of locations; means for excluding said analog signal for a given location from said averaging means when said analog signal creates said white digital signal; and, means for creating a gray digital signal in the absence of said white and black signals for a given location.

4,296,406

PRESSURE SENSITIVE SWITCH STRUCTURE

Billy J. Pearson, Bluff City, Tenn., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,970
Int. Cl.³ G08C *21/00*
U.S. Cl. 340—166 R **6 Claims**



1. A pressure sensitive matrix switch device comprising:

an insulative base,

a first conductive pad means having a plurality of switch pads,

a second conductive pad means,

at least one of said pads being mounted on said base,

a pressure sensitive conductive-resistive material intermediate said conductive pad means,

said conductive-resistive material normally displaying a very high resistance therebetween when no pressure is applied,

said conductive-resistive material displaying a low resistance therebetween when a light pressure is applied,

means for applying pressure to said conductive pads to compress said conductive-resistive material and to change the resistance of said conductive-resistive material from a relatively high ohmic value to a relatively low ohmic value,

voltage source means connected to the said second conductive pad means,

said change of said conductive-resistive material from a relatively high ohmic value to a relatively low ohmic value for generating a voltage signal from one of said switch pads indicative of a particular switch device being operated, and

logic encoder means coupled to said voltage signal for generating binary coded signals indicative of one of said matrix switch devices being operated.

4,296,407

DIGITAL FREQUENCY SYNTHESIZER WITH FREQUENCY DIVIDER PROGRAMMABLE IN RESPONSE TO STORED DIGITAL CONTROL SIGNAL

Hiroshi Minakuchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Osaka, Japan

Filed May 14, 1979, Ser. No. 38,991
Int. Cl.³ H03L *7/18;* H03K *13/20*
U.S. Cl. 340—347 CC **10 Claims**

1. A digital frequency synthesizer having a programmable frequency divider for dividing the frequency of a standard frequency signal by a variable integral multiple, comprising, means for generating a manually adjustable analog control signal, analog-to-digital converter means for converting said

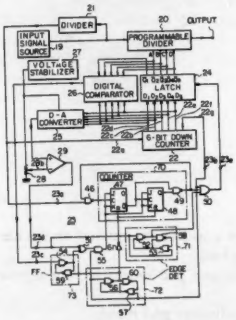
analog control signal into a digital signal, and a storage medium for storing said digital signal, the output of said storage medium representing said integral multiple;

wherein said analog-to-digital converter means comprises means for detecting the difference between said analog control signal and the stored digital signal to reset said storage medium to the digital signal generated at the instant said difference exceeds a predetermined value; and further

wherein said difference detecting means comprises:

a source of clock pulses;

a first binary counter receptive of said clock pulses to generate a digital signal varying stepwisely in response to each clock pulse, the output of said binary counter being connected to the input of said digital storage medium;



a digital comparator for generating an output signal in response to the occurrence of a coincidence between the input and output of said storage medium;

a digital-to-analog converter connected to the output of said binary counter to convert said digital signal into a corresponding analog signal;

an analog comparator for generating an output signal in response to the occurrence of a coincidence between said analog control signal and said analog signal delivered from said digital-to-analog converter; and

means for resetting said storage medium to store the instantaneous value of the digital signal generated by said first binary counter when the interval elapsed between the time of generation of an output signal of said digital comparator and the time of generation of an output signal of said analog comparator exceeds a predetermined value.

4,296,408

LOCATION TRANSMITTING SYSTEM

Jules K. Neuringer, Belle Harbor, N.Y., assignor to Portronix Communications Inc., Brooklyn, N.Y.

Filed Apr. 14, 1980, Ser. No. 139,759
Int. Cl.[3] G08B *1/08*; H04Q *7/00*
U.S. Cl. 340—539 **4 Claims**

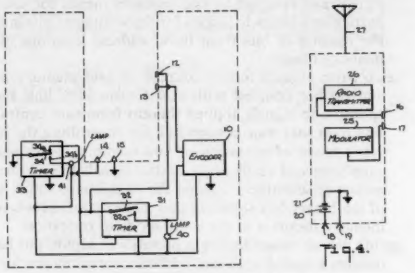
1. A location transmitting system comprising:

a mobile unit including power supply means having external terminals;

a plurality of encoder means at different predetermined locations for generating coded signals individually representative of said locations, each of said encoder means having external terminals for contacting said power supply terminals of said mobile unit;

a radio transmitter in said mobile unit for transmitting a radio signal from each of said encoder means locations;

each of said encoder means being energized and each of said encoder means being effective to modulate said transmitter to transmit an encoded radio signal representative of the location when said mobile unit is so positioned that



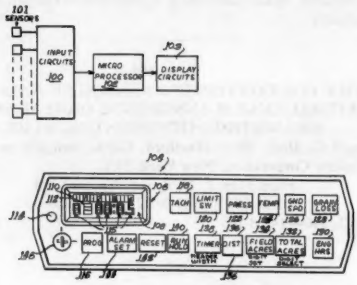
said power supply terminals thereof contact said external terminals of said encoder means.

4,296,409

COMBINE PERFORMANCE MONITOR

Roger B. Whitaker, Crystal Lake, and Charles W. Blevins, Auburn, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.

Filed Mar. 12, 1979, Ser. No. 19,287
Int. Cl.[3] A01D *41/00*; G06C *29/00*; G08B *19/00*
U.S. Cl. 340—684 **18 Claims**



1. A combine performance monitor for a combine having a plurality of sensor means for detecting a plurality of different operating conditions of the combine and for providing sensor signals corresponding to said conditions, said combine performance monitor comprising: display means, operator accessible control and selection means and a programmable special purpose computer including means for storing a predetermined computer program, said computer being coupled to said sensor means, to said control and selection means and to said display means for calculating a plurality of values of predetermined combine functions related to combine performance in accordance with said sensor signals and with said predetermined program and for selectively energizing said display means to provide observable indications of said values, said operator accessible control and selection means and said special purpose computer including cooperating customizing means for selectively modifying said predetermined computer program in accordance with combine operating characteristics so as to customize said combine performance monitor for operation with any one of a plurality of combines having different operating characteristics.

4,296,410

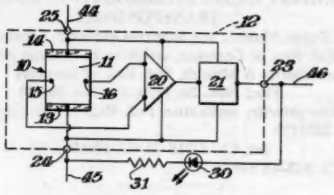
TWO-STATE HALL ELEMENT PROXIMITY SENSOR DEVICE WITH LAMP INDICATOR

Jacob K. Higgs, Concord, and Grant D. Avery, Loudon, both of N.H., assignors to Sprague Electric Company, North Adams, Mass.

Filed Feb. 25, 1980, Ser. No. 124,389

Int. Cl.³ G08B *21/00*; H01H *36/00*; H01L *43/06*

U.S. Cl. 340—686 **6 Claims**



1. A proximity sensor kit having two basic component parts capable of being mounted to a fixed and a movable member of a machine, respectively, for producing an electrical output signal and a visual indication when a portion of said movable member moves to within a predetermined distance with respect to a portion of said fixed member, said kit comprising the combination of said parts, namely:

(a) a two-state Hall element proximity sensor device, adapted to be mounted to said fixed member portion, comprising a Hall element and a voltage-threshold detector means being connected to the output of said Hall element for generating a particular electrical signal only when the magnetic field at said element exceeds a predetermined magnitude in a predetermined polarity; a housing containing said sensor device, the plane of said element being positioned parallel to and adjacent to an outer face of said housing; and an indicator lamp means for providing one state of illumination only when excited by said signal, said lamp means including a lamp that is connected to the output of said detector means and is attached to and protrudes from another face of said housing to be seen from many directions of viewing and to provide visual indication whether said particular electrical signal is present;

(b) a magnet adapted to be mounted to said movable member portion in such a position that when said fixed portion is within said predetermined distance, one of the poles of said magnet substantially faces said sensor, said magnet providing an ambient magnetic field at said Hall element of said predetermined polarity and of said predetermined magnitude.

4,296,411

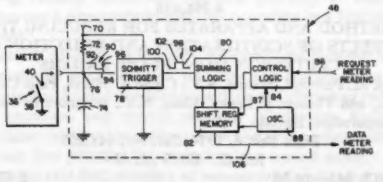
ELECTRONIC REMOTE METER READING APPARATUS

Pat Romanelli, and Robert J. Romanelli, both of 224 Brook St., Harrington Park, N.J. 07640

Filed Sep. 25, 1978, Ser. No. 945,400

Int. Cl.³ G08C *19/00, 19/16*

U.S. Cl. 340—870.02 **9 Claims**



1. Apparatus for converting a standard meter, having a plurality of rotatably driven dial elements indicating total units of a utility measured by said meter, into a meter capable of being read from a remote location,

said apparatus comprising magnetic means mounted on the single dial element of said meter which indicates the lowest whole unit of utility consumption measured, said magnetic means being mounted for rotation with said single dial element,

a single magnetic field sensitive element fixedly mounted on said meter in proximity to said single dial element and positioned to register intermittently with said magnetic means as said single dial element is rotated to produce an electrical signal in response to each field interception during rotation of said single dial element,

said magnetic means comprising at least one permanent magnet secured to said single dial element and positioned to produce one said electrical signal in response to the consumption of a single whole unit of utility consumed and indicated by said single dial element,

signal processing means for receiving said electrical signals to produce a unit pulse indicative of each field interception of said sensitive element by said magnetic means,

counting means for receiving and summing said pulses to indicate the total units of utility measured by said meter,

storage means for receiving said total units of information of utility measured and storing the same in a memory bank for future information, and

interrogator means for selectively interrogating said storage means for receiving and transmitting information as to the total units measured over a selected time period.

4,296,412

METHOD AND APPARATUS FOR SIGNAL TRANSMISSION

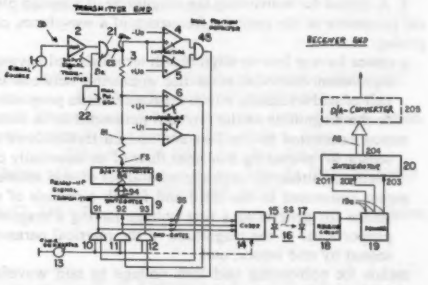
Jiri Mastner, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Nov. 8, 1979, Ser. No. 92,520

Claims priority, application Switzerland, Dec. 1, 1978, 12295/78

Int. Cl.³ G08C *19/16, 25/00*

U.S. Cl. 340—870.19 **15 Claims**



1. A method of transmitting signals between the transmitter end and receiver end of a transmission system, especially for transmitting current and voltage measurement signals by a potential bridging-transmission channel with pulse modulated electromagnetic waves, comprising the steps of:

comparing at the transmitter end an input signal with a follow-up signal which follows the input signal;

generating a control signal derived from the difference between the input signal and the follow-up signal;

forming as the control signal a multi-value control signal having different signal values;

correlating two signal values to both signs of the difference between the input signal and the follow-up signal;

correlating a third signal value to not exceeding a predeter-

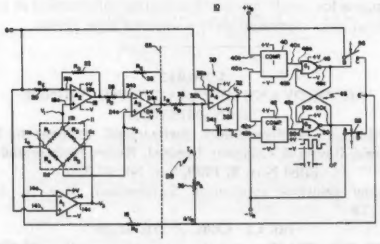
mined threshold value of the magnitude of such difference;
transmitting the control signal to the receiver end;
utilizing the control signal at the receiver end for obtaining an output signal corresponding to the received signal by controlling an integrating element;
obtaining the output signal by timewise up-and-down integration at the first and second values and by fixedly holding the existing integrated value at the third value of the control signal;
triggering resetting of the follow-up signal to the value null as a function of the occurrence of null positions during the time course of the input signal;
transmitting a corresponding resetting signal to the receiver end; and
employing the resetting signal at the receiver end for resetting the output signal to null.

4,296,413

RESISTANCE-BRIDGE TO FREQUENCY CONVERTER WITH AUTOMATIC OFFSET CORRECTION

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 28, 1979, Ser. No. 79,825
Int. Cl.³ G08C *19/04, 19/12*
U.S. Cl. 340—870.38 **14 Claims**



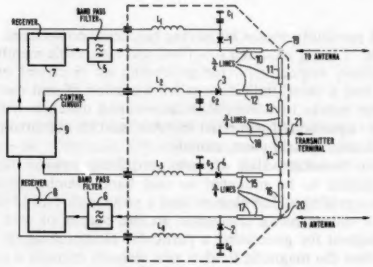
1. A circuit for converting the magnitude of a sensed physical parameter to the periodic frequency of a waveform, comprising:
a sensor having first through fourth terminals and having an equivalent electrical resistance appearing between each pair of said terminals, which resistance varies proportional to the magnitude of the physical parameter to be sensed;
means connected to the first and second terminals of said sensor for providing a current flow of an essentially constant magnitude through the resistances of said sensor;
means connected to the third and fourth terminals of said sensor for generating a first voltage having a magnitude proportional to the magnitude of the physical parameter sensed by said sensor; and
means for converting said first voltage to said waveform having a frequency substantially proportionally to the magnitude of said sensed physical parameter, including first and second reference potential sources, having essentially identical magnitudes and opposite polarities;
means having first and second inputs respectively receiving said first voltage and a second voltage for integrating, with respective to time, the sum of the first and second voltages to provide an output voltage;
comparative means receiving said first and second reference potentials and said output voltage of said integrating means for providing first or second signals when the output voltage of said integrating means is equal to said first or second reference potentials, respectively; and
means for connecting said first or second reference potential to a common node, at which said second voltage appears with polarity selected to reverse the integration direction of said integrating means, responsive respectively to the generation of said comparing means first or second signal;
each of said first and second signals periodically alternating in polarity at a frequency substantially proportional to said first voltage; one of said first and second signals being said waveform.

4,296,414

P-I-N TYPE DIODE HIGH FREQUENCY SWITCH FOR SECONDARY RADAR INTERROGATION DEVICES AND TRANSPONDERS

Franz Beyer, Munich, and Siegfried Sedlmair, Groebenzell, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,638
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855173
Int. Cl.³ G01S *13/02;* H01P *1/15*
U.S. Cl. 343—5 SW **8 Claims**



1. A P-I-N type diode high frequency switch provided in a secondary radar transponder which has an antenna diversity device equipped with two antennas, said P-I-N type diode high frequency switch being provided for supplying one of the two antennas with required pulses by means of two P-I-N type diodes operated by a control circuit either in the blocking state or in the short circuit state, one terminal of said P-I-N type diodes being respectively connected, via a T-element consisting of three quarter-wave length line pieces, to the transmitter terminal and to the terminal for one antenna or, respectively, to the terminal for the other antenna, as well as for relaying the reception signals existing at the two antenna terminals to two receivers of which each is associated with one antenna and which has connected at its input a band pass filter for blocking the transmission signal but allowing the reception signals to pass therethrough, characterized in that each of said two antenna terminals (**19, 20**) is directly connected to the associated band pass filter (**5, 6**) only through one line (**23, 24**); and the sum of the electrical length of the input impedance of one of the band pass filters (**5, 6**) and the electrical length of one of the lines (**23, 24**) which are between the band pass filter and the terminal of the antenna associated with this band pass filter is dimensioned such that a no-load condition occurs at the antenna terminal at the transmission frequency.

4,296,415

METHOD AND APPARATUS FOR REDUCING THE EFFECTS OF SCINTILLATION AND REJECTION OF CLUTTER IN MONOPULSE RADARS

Frank M. Pelton, Clarence, N.Y.; Clyde A. Miller, Falls Church, Va., and Thomas F. Leney, Elma, N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

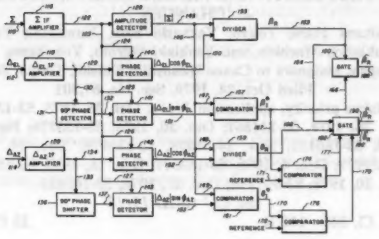
Filed Feb. 6, 1974, Ser. No. 441,201
Int. Cl.³ G01S *13/44*
U.S. Cl. 343—16 M **5 Claims**

3. A circuit for processing radar return signals in a four horn monopulse radar system for reducing rain, sea and land clutter,

for reducing errors due to scintillation and for identifying tall, narrow structures having a much greater angular extent in the elevation plane than in the azimuth plane including:

means for processing radar return signals to obtain signals representing the real part of the complex angle of arrival;

means for applying threshold levels and for processing radar return signals to obtain thresholded signals indicative of the imaginary part of the complex angle of arrival;



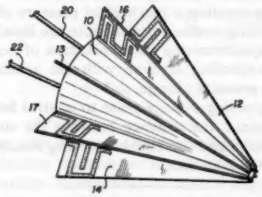
means for processing the signals representing the real part of the complex angle of arrival in response to the thresholded signals indicative of the imaginary part of the complex angle of arrival whereby clutter and errors due to scintillation may be reduced and tall, narrow structures may be identified.

4,296,416

DUAL MODE LOG PERIODIC MONOPOLE ARRAY

Wayne R. Harader, Garland, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Oct. 26, 1979, Ser. No. 88,564
Int. Cl.³ H01Q *11/10*
U.S. Cl. 343—792.5 **12 Claims**



1. A dual mode antenna, comprising:

a cone having a conducting surface,

a first plurality of log periodic monopole elements spaced about and attached to said conducting surface and extending radially therefrom, said first plurality of elements having a phase relationship for operating in a first mode, and

a second plurality of log periodic monopole elements interdigitated with said first plurality and spaced about and attached to said conducting surface and extending radially therefrom, said second plurality of elements having a phase relationship distinct from the phase relationship of said first plurality for operating in a second mode,

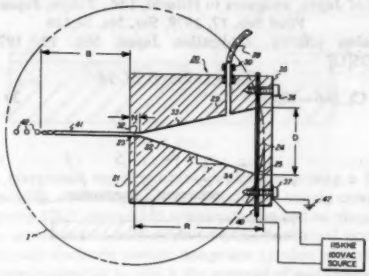
wherein said first plurality of monopole elements has a pattern to establish a progressive phase relationship around said cone.

4,296,417

INK JET METHOD AND APPARATUS USING A THIN FILM PIEZOELECTRIC EXCITOR FOR DROP GENERATION WITH SPHERICAL AND CYLINDRICAL FLUID CHAMBERS

Roger G. Markham, Webster, and Doyle P. Skinner, Jr., Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 4, 1979, Ser. No. 45,044
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **20 Claims**



1. Fluid drop generating apparatus comprising

a body including a fluid chamber, inlet means for coupling the chamber to a pressurized source of fluid and at least one nozzle means coupled to the chamber for emitting a continuous stream of fluid from which drops are formed and

piezoelectric film excitation means located within the chamber for stimulating pressure variations in a fluid within the chamber due to dimensional changes in the excitation means wherein

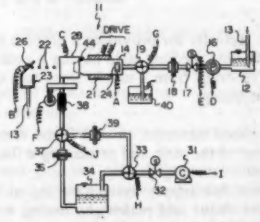
said chamber is substantially a cone formed as a conical section of a sphere with the nozzle means adjacent the apex of the cone and the excitation means located in close proximity to a rigid wall forming the base of said cone and opposite the apex.

4,296,418

INK JET PRINTING APPARATUS WITH REVERSE SOLVENT FLUSHING MEANS

Hiroshi Yamazaki, and Takuro Isayama, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 23, 1980, Ser. No. 158,335
Claims priority, application Japan, May 26, 1979, 54-64603
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **6 Claims**



1. An ink jet printing apparatus including nozzle means for ejecting a jet of ink and ink supply means for supplying ink to the nozzle means, characterized by comprising:

sensor means for sensing an ink clog in the nozzle means;

cap means for covering the nozzle means;

solvent supply means for supplying solvent to the cap means; and

control means for moving the cap means into covering engagement with the nozzle means and controlling the solvent supply means to supply solvent to the cap means in response to the sensor means sensing the ink clog.

4,296,419

MEMBER FOR RECORDING INFORMATION

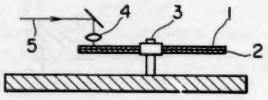
Motoyasu Terao, Tokyo; Kazuo Shigematsu, Kawasaki; Masahiro Ojima, Kokubonji, and Seiji Yonezawa, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,424

Claims priority, application Japan, Sep. 19, 1978, 53-127535[U]

Int. Cl.³ G01D *15/34*

U.S. Cl. 346—135.1 **20 Claims**



1. A member for recording information by forming apertures or recesses in a thin film owing to heat generated by projecting a recording beam onto the thin film, comprising a thin film on a substrate, wherein said thin film comprises an antimony-bismuth alloy having an antimony content lying within a range of from 1% to 15% inclusive in terms of percentage of an average number of atoms in a thickness direction of said thin film, whereby deterioration of the recording characteristic of the thin film with aging of the member is suppressed.

4,296,420

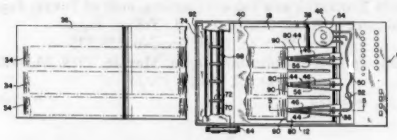
CHART RECORDER HAVING PRESSURIZED INK SUPPLY AND Z FOLD PAPER FEED AND IMPROVED CHART RECORDING METHOD

Thomas F. Dambach, Glendale, and James R. Ricketts, Milwaukee, both of Wis., assignors to Marquette Electronics, Inc., Milwaukee, Wis.

Filed Nov. 8, 1976, Ser. No. 740,003

Int. Cl.³ G01D *15/16, 15/34*

U.S. Cl. 346—140 R **17 Claims**



1. A chart recorder for providing a graphic recording on a Z-folded recording medium strip having a path of movement through the recorder from a supply stack to a discharge, said recorder comprising:

a frame;

a writing platen mounted on said frame along the path of movement of the strip and presenting a flat, hard surface over which said strip passes;

a pressurized ink supply system having at least one pen positioned above said platen and having a tip urged into contact with said strip as it passes over said platen;

drive means positioned downstream of said writing platen for engaging the strip to draw it off the supply stack and over the writing platen; and

pressure means mounted on said frame, said pressure means including a flat pressure plate positioned over the surface of said platen and lying generally parallel thereto, said plate being positioned adjacent said pen tip immediately upstream thereof for pressing the strip flat onto the platen under said pressure plate and pen tip and for generating tension in the strip when it is moved by the drive means which further causes the strip to lie flat across the platen.

4,296,421

INK JET RECORDING DEVICE USING THERMAL PROPULSION AND MECHANICAL PRESSURE CHANGES

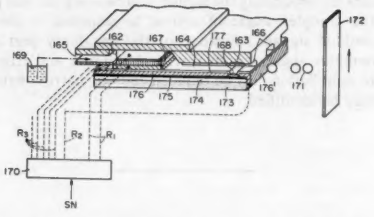
Toshitami Hara, Tokyo; Yashushi Sato, Kawasaki; Yasushi Takatori, Machida, and Yoshiaki Shirato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1979, Ser. No. 87,801

Claims priority, application Japan, Oct. 26, 1978, 53-131860; Oct. 26, 1978, 53-131861; Oct. 30, 1978, 53-133376; Nov. 14, 1978, 53-140111; Nov. 14, 1978, 53-139978; Nov. 14, 1978, 53-139979; Dec. 4, 1978, 53-150377; Dec. 15, 1978, 53-156102; Dec. 20, 1978, 53-157148; Dec. 27, 1978, 53-165883

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **23 Claims**



1. A device for recording comprising ejecting a liquid recording medium by heat energy which comprises a recording head composed of

a discharging orifice for ejecting the liquid recording medium in a form of droplets,

an inlet for introducing the liquid recording medium,

a liquid chamber for holding the liquid recording medium, and

a heating element for applying heat energy to the liquid recording medium in the liquid chamber, and

a means for generating a mechanical pressure change in the liquid recording medium flowing into the liquid chamber, a means for synchronizing the application of heat energy to the liquid recording medium with the generation of the mechanical pressure change, and

a means for applying voltage pulse to control heating by the heating element, the distance between the surface of the heating element and the liquid recording medium being not more than 100 microns.

4,296,422

IMAGE RECORDING MATERIAL AND IMAGE RECORDING METHOD USING THE SAME

Kazuhiro Kawaziri; Masato Fujiwara; Isamu Hatanaka; Masatoshi Tabei; Akio Higashi, and Mitsuharu Nirasawa, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 24, 1979, Ser. No. 6,022

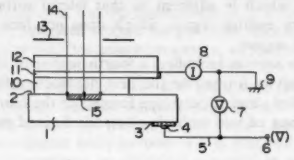
Claims priority, application Japan, Feb. 8, 1978, 53-13300

Int. Cl.³ G01D *15/14;* G03G *15/00*

U.S. Cl. 346—160 **13 Claims**

7. A method of recording an image on an image recording member comprising (a) a recording medium including a support base, at least one surface of which is electrically conductive and a recording layer provided on the electrically conductive surface of said support base containing an oxidizable or reducible compound, and (b) a photoconductor disposed in contact with a surface of said recording layer of said recording

medium, said photoconductor having a specific resistance of not more than 10^9 Ωcm, where the boundary between the photoconductor and the recording layer is electrically rectifying, said method comprising the steps of



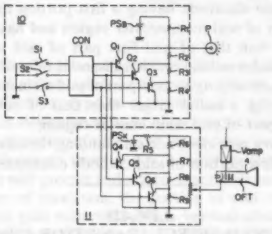
applying a reverse bias voltage across the said boundary and imagewise exposing the photoconductor while said bias voltage is being applied to the boundary.

4,296,423

DEVICE FOR ADJUSTING IMAGE DENSITY IN COMPOSITE INFORMATION RECORDING APPARATUS

Hiroya Nakamura, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1979, Ser. No. 66,423
Claims priority, application Japan, Aug. 18, 1978, 53-100017
Int. Cl.³ G01D *15/40*; G03G *15/00, 15/00*
U.S. Cl. 346—160 **2 Claims**



1. In a composite information recording apparatus including a photoconductive medium on which an electrostatic latent image is formable in accordance with a copying and/or a recording operation, a developing device having a developing electrode for developing the latent image on the photoconductive medium, means for supplying a bias voltage applied between the developing electrode and the photoconductive medium, and a signal reproducing device for use in the recording operation; an image density adjusting device, comprising:

switch means operable for selectively adjusting the bias voltage applied to the developing electrode in accordance with the density of an original to be copied;

means supplying a variable voltage to said signal reproducing device; and

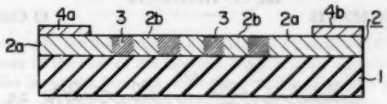
further means operable by said switch means for controlling said variable voltage supply means to apply a variable voltage to said signal reproducing device in correspondence with the selectively adjusted bias voltage applied to the developing electrode, whereby image density of the recording operation is controlled in accordance with image density control of the copying operation.

4,296,424

COMPOUND SEMICONDUCTOR DEVICE HAVING A SEMICONDUCTOR-CONVERTED CONDUCTIVE REGION

Ichiro Shibasaki; Kaoru Ohmura, and Takeo Kimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1979, Ser. No. 22,916
Claims priority, application Japan, Mar. 27, 1978, 53-34062; Mar. 27, 1978, 53-34063; Aug. 9, 1978, 53-96114
Int. Cl.³ H01L *27/24, 45/00, 23/48*
U.S. Cl. 357—1 **20 Claims**



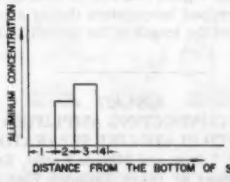
1. A compound semiconductor device comprising a functional portion of a compound semiconductor mainly comprising a group III-V compound semiconductor and an electrode portion connected to said semiconductor functional portion, wherein said electrode portion comprises a region of the compound semiconductor in which the material of said compound semiconductor is changed in the solid phase state to cause a change in its energy band structure and is thereby converted to a conductor in ohmic contact with the contiguous portion of the compound semiconductor.

4,296,425

LUMINESCENT DIODE HAVING MULTIPLE HETERO JUNCTIONS

Jun-ichi Nishizawa, Sendai, Japan, assignor to Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 867,158, Jan. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 761,468, Jan. 21, 1977, abandoned, which is a continuation of Ser. No. 543,617, Jan. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 314,393, Dec. 12, 1972, abandoned. This application Sep. 18, 1979, Ser. No. 76,675
Claims priority, application Japan, Dec. 14, 1971, 46-100623
Int. Cl.³ H01L *33/00, 29/203, 29/205*
U.S. Cl. 357—17 **14 Claims**



2. A luminescent diode comprising:

A p+ type substrate;

at least one unit consisting of a p-type layer of a certain band gap and an n-type layer of a band gap wider than said certain band gap and epitaxially grown on said p-type layer to form a heterojunction at the interface between said p-type layer and said n-type layer, said unit being disposed in such a way that said p-type layer is located closer to said substrate than is said n-type layer, the and gap of said p-type layer increasing monotonically with distance from said substrate;

said substrate being capable of absorbing light entering there into from said p-type layer; and

a low resistivity contact disposed on an outermost surface of

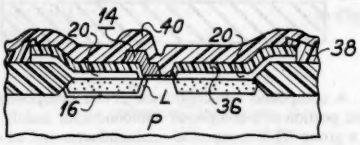
said unit opposite to said substrate, said contact having an area contacting said outermost surface smaller than the area of said outermost surface for allowing a light output to be taken at said outermost surface.

4,296,426

PROCESS FOR PRODUCING AN MOS-TRANSISTOR AND A TRANSISTOR PRODUCED BY THIS PROCESS

Jean Gilles, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 13, 1979, Ser. No. 11,923
Claims priority, application France, Feb. 17, 1978, 78 04528
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23 **13 Claims**



1. A method for making an insulated gate field effect transistor of the type having a source region with a source contact electrode of polycrystalline silicon, a drain region with a drain contact electrode of polycrystalline silicon, and a channel region between the source and drain regions with an insulated control gate above the channel region, the method comprising the steps of:

providing a semiconductor substrate;

forming source and drain contact electrodes of polycrystalline silicon on the upper surface of the semiconductor substrate, each of said electrodes being doped with an impurity of a first type of conductivity and wherein at least one of the source and drain electrodes contains an impurity of the opposite type of conductivity to said first type and has a rate of diffusion greater than the rate of diffusion of the impurity of the first type of conductivity; and

heating the substrate so as to simultaneously form a source region and a drain region in the semiconductor substrate by diffusion of the impurity of the first type of conductivity from the electrodes into the substrate so as to produce a laterally diffused part of the channel adjacent to the source or drain region, said step of heating being effected at a predetermined temperature during a predetermined time to control the length of the laterally diffused part of the channel.

4,296,427

REVERSE CONDUCTING AMPLIFIED GATE THYRISTOR WITH PLATE-LIKE SEPARATOR SECTION

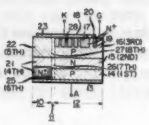
Minami Takeuchi, Tokyo, and Minoru Kuriki, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 802,070, May 31, 1977, abandoned.
This application Aug. 28, 1979, Ser. No. 70,655
Claims priority, application Japan, May 31, 1976, 51/63242
Int. Cl.³ H01L *29/747*
U.S. Cl. 357—39 **1 Claim**

1. A reverse conducting thyristor comprising a thyristor section, diode section and a semiconductor separator section interposed between the thyristor and diode sections so as to prevent electrical interference between the thyristor and diode sections, said three sections being integrally formed into a cylindrical body,

said thyristor section including a first region of a first conductivity type formed on a first electrode; a second region of a second conductivity type formed on the first region, a third region of the first conductivity type formed on the type formed in the third region, a cathode electrode a part of which is formed on the main emitter region, an auxiliary emitter region formed in the third region, an auxiliary gate electrode formed partly on the third region and partly on the auxiliary emitter region, and a main gate electrode formed on that surface portion of the third region which is adjacent to that lateral surface of the auxiliary emitter region which does not face the main emitter region;

said diode section including a fourth region of the second conductivity formed on the first electrode, a fifth region of the first conductivity type formed on the fourth region, and a part of said cathode electrode formed on the fifth region;



said semiconductor separator section including a sixth region of the first conductivity type formed on the first electrode, a seventh region of the second conductivity type formed on the sixth region, and an eighth region of the first conductivity type formed on the seventh region, said sixth, seventh and eighth regions being integrally formed into a flat plate;

said cathode electrode having a first portion disposed on a first part of said main emitter region and having a radius smaller than that of said first part of said main emitter region and a second portion disposed on said fifth region and on a remaining second part of said main emitter region and having a radius larger than that of said remaining second part of said main emitter region;

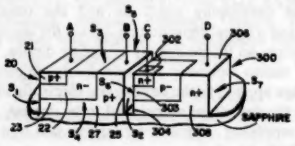
said auxiliary gate electrode surrounding the outer periphery of said first portion of said cathode electrode.

4,296,428

MERGED FIELD EFFECT TRANSISTOR CIRCUIT AND FABRICATION PROCESS

Tegzi P. Haraszti, Garden Grove, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 28, 1979, Ser. No. 52,881
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—41 **48 Claims**



1. A semiconductor device comprising:

a first body of semiconductor material having first and second spaced apart surfaces, including a first surface zone of a first conductivity type and a first dopant concentration adjacent said first surface, a second surface zone of a second conductivity type and a second dopant concentration different from said first concentration adjacent said

first surface and said first surface zone, and a third surface zone of said first conductivity type and said first dopant concentration adjacent said first surface and said second surface zone, said third surface zone being spaced apart from said first surface zone such that said second surface zone lies between said first and said third surface zones; said first and said second surface zones forming respectively first and second active regions of a first transistor device, and said second surface zone forming a control region of said first transistor device; a fourth surface zone of said first conductivity type and said first dopant concentration formed in said first body, said fourth surface zone being disposed adjacent said second surface, and directly connected with said third surface zone through a semiconductor body portion of said first body;

means for applying an electrical potential to said first and said third surface zones; and

control means disposed adjacent said second surface zone for controlling the flow of current through said second surface zone.

4,296,429

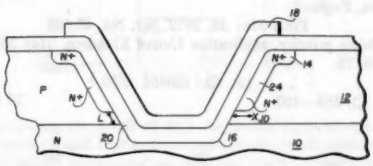
VMOS TRANSISTOR AND METHOD OF FABRICATION

James E. Schroeder, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 932,232, Aug. 9, 1978. This application Nov. 26, 1979, Ser. No. 97,457

Int. Cl.³ H01L *29/06*

U.S. Cl. 357—55 **8 Claims**



1. In a vertical insulated gate field effect transistor having a first layer of a first conductivity type, a second layer of a second conductivity type on said first layer, a horizontal surface region in said seconod layer of said first conductivity type, a groove extending from said horizontal surface region through said second layer and into said first layer, a layer of insulation in said groove and a gate material in said groove and on said layer of insulation, the portion of said second region adjacent said gate material being a vertical channel between said first layer and said horizontal surface region, the improvement comprising a vertical surface region in the lateral surface of said second layer adjacent said gate, contiguous to said horizontal surface region and terminating vertically within said second layer, said vertical channel being between the end of said vertical surface region and said first layer.

4,296,430

MAGNETIC RECORDING WITH REDUCED CROSS-TALK AND INTERCHANNEL TIME DISPLACEMENT

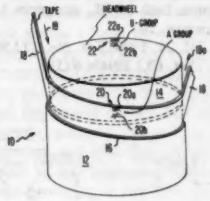
Henry R. Warren, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 12, 1979, Ser. No. 84,395

Int. Cl.³ H04N *5/78*

U.S. Cl. 358—8 **4 Claims**

1. A magnetic head device for recording on magnetic tape, said device comprising a rotating drum, two pairs of magnetic heads, each pair comprising a wide width head for recording high frequency information and a narrow width head for recording low frequency information, each of said pairs having a gap between the heads comprising the pair, the order of the high and low frequency heads within one of said pairs being reversed with respect to the order of the high and low frequency heads of the remaining pair, said pairs being mounted on said drum to provide that the recording tracks laid down on



the tape by the low frequency heads have a guardband therebetween of the sum of the amounts by which the narrow heads differ in widths from the wide heads of the same pair respectively.

4,296,431

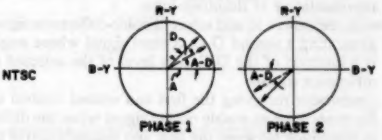
HIGH-RESOLUTION TELEVISION SYSTEM

Kenneth F. Holland, Canyon Country, Calif., assignor to Ygnacio Inc., Santa Barbara and Compact Video Systems Inc., Burbank, both of, Calif.

Filed Apr. 11, 1980, Ser. No. 139,475

Int. Cl.³ H04N *9/38*

U.S. Cl. 358—12 **17 Claims**



1. A method for conveying color information in a television system, comprising the steps of:

(a) producing first and second color signals together containing said color information;

(b) using each of said color signals to separately modulate a carrier signal;

(c) reversing the phase of said carrier signal modulated by said first color signal at a first rate;

(d) reversing the phase of said carrier signal modulated by said second color signal at a second rate different from said first rate;

(e) combining said modulated carrier signals into a single modulated color subcarrier;

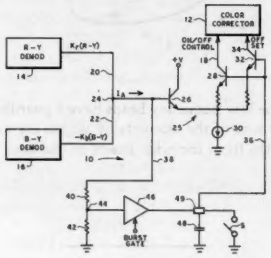
(f) transmitting said color subcarrier;

(g) demodulating said subcarrier upon receipt to obtain said first and second color signals.

4,296,432
DYNAMIC ENABLING NETWORK FOR A COLOR CORRECTION CIRCUIT

Christopher M. Engel, Arlington Heights, and Gopal K. Srivastava, Buffalo Grove, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 28, 1980, Ser. No. 172,903
Int. Cl.³ H04N 9/535
U.S. Cl. 358—28 **12 Claims**



1. In a television receiver which provides color-difference signals having A.C. components superimposed on a D.C. bias level, and in which a color correction circuit automatically operates on the color-difference signals to adjust their effective phase toward a fleshtone axis, a dynamic enabling and disabling network for the color correction circuit, comprising:

means for combining selected color-difference signals to generate a first control signal having a D.C. level corresponding to the D.C. bias level of the color-difference signals and having an A.C. component whose magnitude is near a maximum when the color-difference signals are representative of fleshtone hues;

means responsive to said selected color-difference signals for generating a second D.C. control signal whose amplitude is a function of the D.C. bias level of the selected color-difference signals;

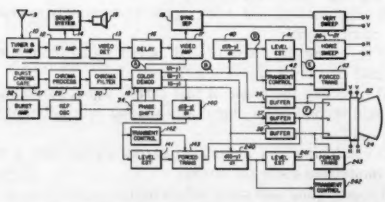
a comparator receiving the first and second control signals for generating an enable output signal when the difference in amplitude between the first and second control signals is indicative of color-difference signals having a phase within a preselected range of fleshtone hues, and for generating a disable output signal when no such difference in amplitude exists; and

means for coupling the output signals of the comparator to the color correction circuit.

4,296,433
COLOR TELEVISION RECEIVING SYSTEM WITH FORCED CHROMA TRANSIENTS

Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Corporation of America, Franklin Park, Ill.

Filed May 19, 1980, Ser. No. 151,360
Int. Cl.³ H04N 9/535
U.S. Cl. 358—37 **9 Claims**



1. In a television receiver including processing circuits producing signals for application to a picture tube, a system for improving transient response, including in combination:

sensing means coupled with the processing circuits of the television receiver for sensing changes in the level of a signal and providing an output indicative thereof;

second means coupled with the output of said sensing means for producing an output signal when a predetermined output signal level is obtained from said sensing means; and

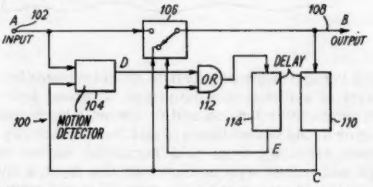
control circuit means coupled with said sensing means and said second means for forcing the signal level applied to the picture tube to a predetermined signal level proprotional to the output of said sensing means irrespective of the level of the signal applied to the picture tube by the processing circuits.

2. The combination according to claim 1 wherein the television receiver is a color television receiver, the processing circuits produce demodulated color signals for application to a color picture tube, and said system is for improving color transient response; and wherein said control circuit means forces said predetermined signal level for a predetermined period of time.

4,296,434
METHOD OF AND APPARATUS FOR MOVEMENT PORTRAYAL WITH A RASTER E.G. TELEVISION, DISPLAY

John O. Drewery, Coulsdon, and Richard Storey, Sutton, both of England, assignors to British Broadcasting Corporation, London, England

Filed May 29, 1979, Ser. No. 43,608
Claims priority, application United Kingdom, May 30, 1978, 23924/78
Int. Cl.³ H04M 5/30
U.S. Cl. 358—105 **22 Claims**



1. A method of portraying movement with a raster display, comprising the steps of:

storing a scan of the display;

comparing a subsequent input scan with the stored scan to detect differences therebetween which may represent motion of a displayed object;

retaining a continuing indication of the positions on the display of the differences thus detected;

retaining the portions of the input scan at positions for which a new difference is detected, and no difference has been detected previously; and

including in the output display the thus-retained portions.

4,296,435
LUMINANCE SIGNAL PROCESSING CIRCUIT

Alain H. d'Hautecourt, Prospect Heights; Wayne E. Bretl, Schaumburg, and Ronald B. Lee, Skokie, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 18, 1980, Ser. No. 179,142
Int. Cl.³ H04N 5/14
U.S. Cl. 358—166 **15 Claims**

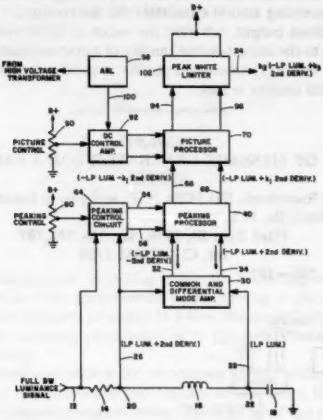
1. In a television receiver of the type having means developing a full bandwidth luminance signal including a low pass component and first and second derivative components of said

low pass component, an improved luminance signal processing circuit comprising:

means responsive to said luminance signal for developing a first control voltage representing said low pass component and a second control voltage representing the combination of said low pass and second derivative components;

amplifier means responsive to said first and second control voltages for developing first and second current mode signals representing, respectively, in phase and 180° out of phase combinations of said low pass and second derivative components;

peaking signal processor means selectively operable for



controlling the levels of only the second derivative components of said first and second current mode signals for developing corresponding third and fourth current mode signals respectively;

picture processor means selectively operable for simultaneously controlling the levels of both the second derivative and low pass components of at least one of said third and fourth current mode signals for developing a corresponding output luminance voltage signal; and

a single source of DC potential coupled only to said picture processor means for supplying the bias energy from which said first, second, third and fourth current mode signals are derived.

4,296,436

NOISE REDUCING SYSTEM

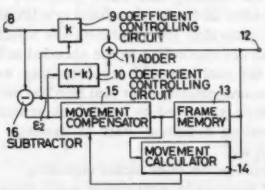
Masahiko Achiha, Iruma, Japan, assignor to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 21, 1979, Ser. No. 68,527

Claims priority, application Japan, Aug. 21, 1978, 53-100951

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—167 **5 Claims**



1. A noise reducing system comprising first circuit means for detecting a variation of a picture from an input picture signal and a past picture signal by mixing said signals with a selectively variable ratio; second circuit means for controlling the mixing ratio between the input picture signal and the past picture signal in response to an output signal of said first circuit means; and memory circuit means for delaying the output of said second circuit means a fixed time period to provide said past picture signal; said second means comprising movement detector circuit means for detecting displacement of the variation of the picture per frame from the output of said memory circuit means and the output of said first circuit means, and movement compensator circuit means coupled between said memory circuit means and said first circuit means and controlled by an output of said movement detector circuit means for generating and providing to the first circuit means a past picture signal which corresponds to the same area as the input picture signal.

4,296,437

CLAMPING CIRCUIT FOR A VIDEO SIGNAL

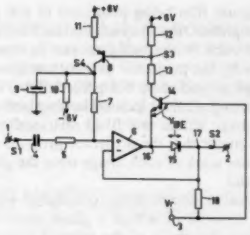
Martinus F. A. M. Geurts, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1980, Ser. No. 113,885

Claims priority, application Netherlands, Mar. 5, 1979, 7901722

Int. Cl.³ H04N *5/16*

U.S. Cl. 358—173 **5 Claims**



1. A clamping circuit for a video signal comprising an input and an output, a differential amplifier having a first and a second input and an output, a capacitor connected between said clamping circuit input and said differential amplifier first input, a capacitor charging and discharging circuit connected to said capacitor at said differential amplifier first input and to said differential amplifier output, a diode coupled between said differential amplifier output and said output of said clamping circuit, means for coupling said clamping circuit output to said differential amplifier second input, means for supplying a reference voltage, and a resistor for coupling said reference voltage to said differential amplifier second input.

4,296,438

PROJECTION AND SCANNING SYSTEM FOR PRODUCING VIDEO SIGNALS FROM MOTION PICTURE FILM AND CONTROL SYSTEM USED THEREIN

Otto Stemme; Wolfgang Ruf, both of Munich, and Eduard Wagensonner, Aschheim, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 136,114

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912667

Int. Cl.³ H04N *3/36*

U.S. Cl. 358—214 **15 Claims**

1. A projection and scanning system designed to repeatedly project images from a motion picture film or from a still picture film onto a fixed horizontal line along which a charge-cou-

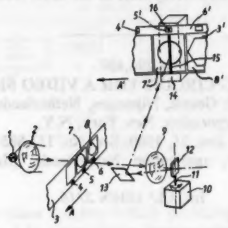
pled image sensor may be placed, in order to produce a flickerless video signal from a motion or still picture, comprising:

a projector which can be loaded with a motion or still picture film and which operates in a manner that images on the film are projected from the projector;

a movable mirror upon which images projected from the projector are directed;

a scanner connected to the mirror and cooperating with the projector in a manner that the mirror is moved to reflect successive horizontal lines of images projected by the projector onto a fixed horizontal line in sequence;

a synchronizer synchronizing operation of the scanner or the mirror movement with the movement of the motion picture film or with the position of each image of the motion



or still picture film being projected in still projection, so that the sequence runs in synchronism from a top horizontal line of each image being moved or unmoved during projection by the projector to a bottom horizontal line of each image projected by the projector;

a phase detecting element located in the plane of the charge-coupled image sensor in a fixed relationship which operates in a manner that the projector projects a phase signal from a phase mark of each image onto the phase detecting element; and

a phase detecting circuit being connected with said phase detecting element in which a phase error signal is produced when the phase of the vertical sync pulses of the video picture differs from the phase of the scanned moved or unmoved picture of the motion or still picture film.

4,296,439

DIGITAL SIGNAL CONTROL SYSTEM IN A FACSIMILE COMMUNICATION

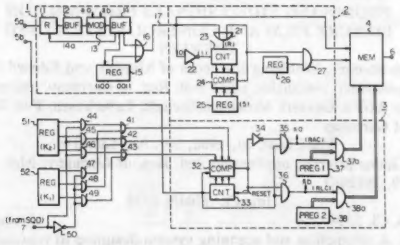
Hiroichi Teramura, Tokyo; Yasuhiro Yamazaki, Hiratsuka; Yasushi Wakahara, Tokyo; Naohiko Hattori, Tokyo; Seiichi Yamamoto, Tokyo, and Kouzo Nakao, Hoya, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 917,163, Jun. 20, 1978, abandoned. This application May 15, 1980, Ser. No. 150,100

Claims priority, application Japan, Jun. 20, 1977, 52-71995

Int. Cl.[3] H04N *7/12*

U.S. Cl. 358—257 **5 Claims**



1. A method for controlling a facsimile system characterized in that the scanning lines of a picture signal are encoded so that (k) number of continuous scanning lines are encoded by a relative address encoding system and the next one scanning line is encoded by run length encoding system and that sequence is repeated, a pair of synchronization codes are defined for each encoding system, and each synchronization code is positioned at the head of each scanning line of a picture signal, each of the synchronization codes have m_1 and m_2 number of continuous 0's inserted between a pair of 1's, a facsimile transmission station interpolates "1" for each series of (MIN(m_i)−1) number of continuous 0's of the picture signal in order to distinguish the picture signal from synchronization codes where MIN(m_i) is the minimum value among m_i and i is 1 or 2, and a receiving station eliminates the interpolated "1" to provide a clean output, wherein the value of (k) is switched according to the instantaneous quality of a communication line so that the value (k) when said quality is good is larger than that when said quality is bad.

4,296,440

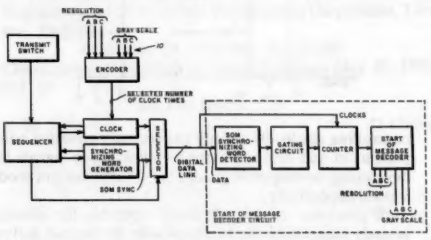
START OF MESSAGE GENERATOR FOR A FACSIMILE SYSTEM

Bernard Rosenheck, Dix Hills, N.Y., assignor to Litton Systems, Inc., Melville, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,757

Int. Cl.[3] H04M *1/36*

U.S. Cl. 358—257 **2 Claims**



1. A start of message generator including means for providing a substantial immunity to transmission line noise for a facsimile system comprising

means for selecting a specific mode of operation from any of a plurality of available modes, each of said modes having a discrete code,

means for encoding the selected mode with its respective code,

synchronizing word generator means for generating a start of message synchronizing word,

clock generator means for generating a selected number of clocks corresponding to the encoded selected mode,

sequencer means including

means for enabling said synchronizing word generator means for generating the start of message synchronizing word,

means for enabling said clock generator means immediately after said start of message synchronizing word has been generated for generating the selected number of clocks corresponding to the encoded selected mode,

means for enabling said synchronizing word generator means immediately after said selected number of clocks has been generated by said clock generator means for generating a second start of message synchronizing word, and

start of message decoder means including

start of message synchronizing word detector means for detecting the first and second start of message synchronizing words,

means for counting clocks,

means for enabling said counting means during the interval between the first and second start of message synchronizing words, and

means for decoding said number of counted clocks into one of said available modes.

4,296,441

PHOTOELECTRIC SCANNING APPARATUS

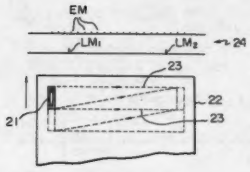
Fumihiro Ogasawara, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 3, 1979, Ser. No. 99,787

Claims priority, application Japan, Dec. 14, 1978, 53-153753

Int. Cl.³ H04N *1/10*

U.S. Cl. 358—293 **4 Claims**



1. A photoelectric scanning apparatus including a charge accumulation type photosensor array having a plurality of photosensor elements arranged in a row, the array being reciprocated for scanning perpendicular to the row, characterized by comprising:

pulse generator means for producing timing pulses in response to incremental movements of the array, the array producing data signals from outputs of all of the elements in response to each timing pulse;

sensor means for producing an enable signal when the array is within an effective scan area in which periods of timing pulses are constant; and

gate means for enabling transmission of the data signals only in response to the enable signal.

4,296,442

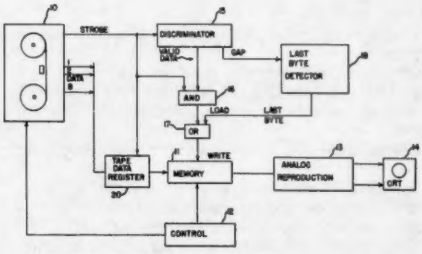
ON-BOARD ANALOG REPRODUCER UNIT FOR OCEAN-BOTTOM SEISMOMETER

Edgar A. Bowden, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,354

Int. Cl.³ G11B *5/00*

U.S. Cl. 360—6 **8 Claims**



1. In a marine exploration seismic exploration system wherein an ocean bottom seismometer unit deployed on the ocean bottom records digitized seismograms on a magnetic medium which is retrieved so that the recorded seismograms can be analyzed, an analog reproducer unit for installation on the exploration vessel which retrieves said magnetic medium comprising:

a magnetic reproducer unit for reproducing said digitized seismograms recorded on said magnetic medium;

a digital memory for storing digital samples reproduced from said medium;

digital to analog converter means for converting said digital samples into an analog signal;

an analog reproduction device for displaying said analog signal so that an operator can monitor said seismograms;

means for producing strobe pulses indicating the time of occurrence of the recording of a digital sample on said medium;

a discriminator for checking the repetition rate of said strobe pulses to discriminate valid strobe pulses from noise; and

gating means responsive to said discriminator and to said strobe pulses for storing said digital samples in said memory only when a valid detection of strobe pulses is obtained.

4,296,443

MAGNETIC HEAD TRACKING CONTROL SYSTEM

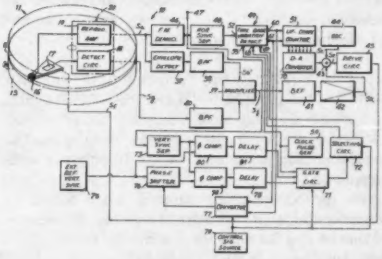
Hitoshi Sakamoto, Zama, and Yoshiaki Wakisaka, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1979, Ser. No. 14,764

Claims priority, application Japan, Feb. 23, 1978, 53-20332

Int. Cl.³ H04N *5/78*

U.S. Cl. 360—10 **62 Claims**



1. An apparatus for reproducing information signals recorded in successive parallel tracks on a record medium, with each of said tracks further containing a positional signal at a predetermined position therealong, comprising:

transducer means movable along each said track for reproducing the information and positional signals recorded therein; transducer deflecting means mounting said transducer means and being operative in response to the reception of an electrical drive signal for deflecting said transducer means in a direction which is transverse in respect to the direction along each of said tracks; means separating said positional signals from the signals reproduced by said transducer means; means receiving the separated positional signals for detecting a time base error of said positional signal reproduced from each of said tracks; and control circuit means for providing said electrical drive signal and including means for varying the latter in accordance with the detected time base error so as to control the deflection of said transducer means in said transverse direction at least in accordance with the detected time base error.

4,296,444

INDUCTIVE SIGNAL TRANSDUCER SUPPLY CIRCUIT PARTICULARLY FOR VIDEO RECORDING USE

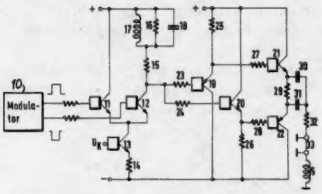
Josef Sochor, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 929,938, Aug. 1, 1978, abandoned. This application Feb. 1, 1980, Ser. No. 117,432

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735498

Int. Cl.³ G11B *5/45, 5/02*

U.S. Cl. 360—65 **7 Claims**



1. Inductive signal transducer supply circuit, particularly for video recording use, to supply signals of essentially square wave pulse form to an inductive transducer to effect a recording in essentially square wave form with minimum wave shape degradation, as the frequency of applied pulse signals and hence the wave length thereof varies, said circuit comprising the combination of

a frequency-dependent compensating network (4) connected in advance of the inductive transducer (5), emphasizing high frequency components of the signal;

a current supply circuit (11, 12, 13; 41) supplying current to the compensating network in accordance with the applied signals;

and a current amplifier (6; 19–29) connected between the compensation network (4) and the inductive transducer (5) and supplying energizing current to said transducer;

with

a connecting cable (33) between the output of the amplifier (6; 19–29) and the input to the transducer (5), said cable having a length which is substantially less than the minimum wave length of the supply signals being applied to the transducer, and presenting essentially only capacitative impedance;

and wherein the compensating network has a frequency component-output signal transfer characteristic which is the inverse of a series network comprising the amplifier and the connecting cable and the transducer.

4,296,445

PHASE SENSOR

Lester F. Schowe, Jr., Morrison, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Apr. 11, 1980, Ser. No. 139,257

Int. Cl.³ G11B *5/45, 5/09*

U.S. Cl. 360—65 **8 Claims**

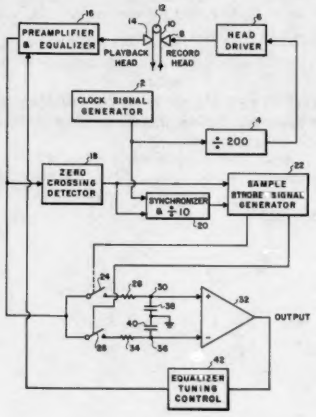
1. In a magnetic recording/playback system, a method of detecting phase shift errors in the playback portion of said system, said method comprising:

recording on a magnetic tape a square wave signal having a frequency of one-third of the bandedge frequency of the system;

playing back the recorded signal through said playback portion to produce a resultant signal having a waveform representing the first and third harmonics of said recorded signal, said waveform having a first and second peak in each positive half cycle;

extracting a time-averaged sample of the amplitude of each of said first and second peaks;

comparing the magnitude of the two time-averaged signals; and



producing a difference signal commensurate with and representative of said phase shift error.

4,296,446

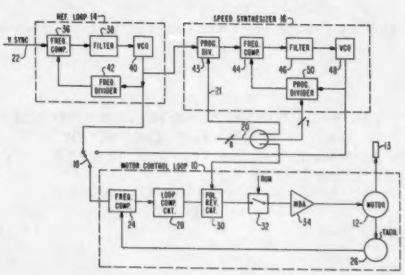
MOTOR SPEED CONTROL CIRCUIT

George S. Zorbalas, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 94,690

Int. Cl.³ G11B *15/46*

U.S. Cl. 360—73 **6 Claims**



1. A circuit for controlling the speed of a motor, said circuit comprising:

a speed synthesizer having first input means for receiving a digital speed command signal, a second input means, and an output means for supplying a variable speed control signal;

a means for supplying a reference signal to said second input means;

a motor drive circuit having an input means for receiving said variable speed control signal and adapted to be coupled to said motor for speed control thereof; and

wherein said speed synthesizer comprises a frequency comparator having a first input coupled to said reference signal means, a second input, and an output;

a filter coupled to said comparator output;

a voltage controlled oscillator having a control input coupled to said filter and an output; and

a programmable divider having an input coupled to said oscillator output, a control input comprising said synthesizer first input means for receiving said digital speed

command signal, and an output coupled to said frequency comparator second input.

4,296,447

MAGNETIC RECORDING AND REPRODUCTION

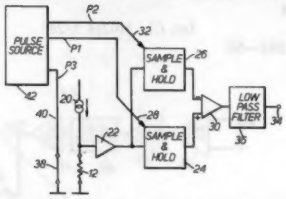
John A. Lewis, Southampton, England, assignor to Racal Recorders, Ltd., Bracknell, England

Filed Dec. 11, 1979, Ser. No. 102,540

Claims priority, application United Kingdom, Dec. 11, 1978, 47983/78

Int. Cl.³ G11B *5/30*

U.S. Cl. 360—113 **9 Claims**



1. A system for reproducing signals stored magnetically on a magnetic storage medium, comprising

a magneto-resistive member having a predetermined input-/output characteristic curve relating changes in the magnetic field which is produced upon it by the stored signals, when it is mounted in juxtaposition to the magnetic storage medium, to the corresponding changes in its electrical resistance,

biasing means for alternately producing biasing magnetic fields acting in opposite directions but parallel to the magnetic field produced by the stored signals and thereby alternately biasing the magneto-resistive member to first and second predetermined operating points on its characteristic curve, whereby the magneto-resistive member produces a succession of first outputs which are dependent on the strength of the field produced by the stored signals in relation to the field represented by the first operating point and a succession of second outputs which alternate in time with the first outputs and are dependent on the strength of the field produced by the stored signals in relation to the field represented by the second operating point, and

output means for producing a composite output from the succession of first and second outputs,

the first and second operating points being selected such that the composite output is more linearly related to the strength of the stored signals than are either the first or the second outputs taken alone.

4,296,448

RECORDING CARTRIDGE HAVING A FLAT SMOOTHING PLANE WITH A RAISED PORTION

Felix Garcia, Jr., Round Rock; Roger A. Hergert, Georgetown; Don C. Mann, Richardson, and Sheldon H. Brown, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1979, Ser. No. 45,378

Int. Cl.³ G11B *5/82, 5/016, 17/32*

U.S. Cl. 360—135 **13 Claims**

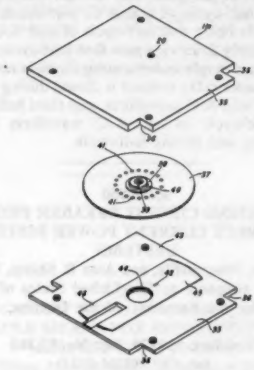
1. A cartridge comprising:

(a) a sheet of flexible information storage media having first and second opposite major surfaces, at least one of said major surfaces for storing information thereon; and

(b) a cartridge housing in the form of a rigid envelope having an internal chamber with first and second surfaces oppositely positioned, at least portions of said first and second surfaces being relatively flat, said media being retained within said chamber, said cartridge housing having:

(i) a first opening extending through a central region of one of said first and second surfaces for providing access to said media to impart rotational motion thereto;

(ii) a second opening extending through said first surface for receiving a magnetic head transducer for respectively reading and/or writing information on said media; and



(iii) said first surface including a raised portion having a curved surface in facing relationship with said media for causing said media to conform to the curvature of said curved surface as it passes over said raised portion, said second opening being substantially contained within said raised portion.

4,296,449

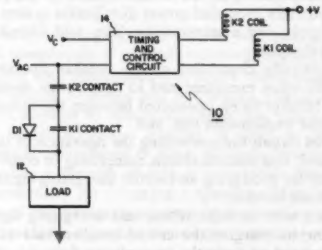
RELAY SWITCHING APPARATUS

Charles W. Eichelberger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1979, Ser. No. 69,618

Int. Cl.³ H02H *3/033*

U.S. Cl. 361—3 **17 Claims**



1. A switching circuit for selectively coupling a load to an A.C. power source, said switching circuit comprising:

(a) a master relay including a master relay contact and a master relay coil;

(b) a pilot relay including a pilot relay and a pilot relay coil, said master and pilot relay contacts being coupled in series with each other and being coupled between said load and said power source to cause said power source to be coupled to said load whenever both said master and pilot relay contacts are closed; and to cause said power source to be completely disconnected from said load whenever at least said pilot relay contact is open; said pilot relay contact being devoid of any additional conductive element thereacross;

(c) a single commutating diode coupled in parallel only with said master relay contact; and

(d) timing and control circuit means for performing a switching operation in which:

(1) said master relay contact is opened during a first half-cycle of the A.C. waveform of said power source during which said single commutating diode is forward-biased;

(2) the state of said pilot relay contact is changed during a second half-cycle of said A.C. waveform, said second half-cycle being that half-cycle of said A.C. waveform immediately following said first half-cycle, and during which said single commutating diode is reverse-biased.

(3) said master relay contact is closed during a third half-cycle of said A.C. waveform, said third half-cycle being that half-cycle of said A.C. waveform immediately following said second half-cycle.

4,296,450

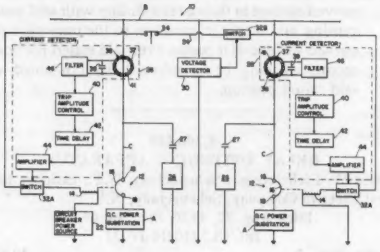
DISCRIMINATING CIRCUIT BREAKER PROTECTION SYSTEM DIRECT CURRENT POWER DISTRIBUTION SYSTEMS

Derek A. Paice, Murrysville, and Alan B. Shimp, Monroeville, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 5, 1979, Ser. No. 82,383

Int. Cl.³ H02H *3/17*

U.S. Cl. 361—50 **3 Claims**



1. A discriminating circuit breaker system for the protection of an electrically grounded power distribution system having a power supply and a transmission line, said circuit breaker system comprising:

an electrically controlled circuit breaker operable to be closed when energized and to open when de-energized, said breaker being connected between the power supply and the transmission line; and

a control circuit for controlling the operation of the circuit breaker, said control circuit comprising in combination:

means for producing an electric energizing signal for the circuit breaker;

a pilot wire through which said energizing signal must flow to energize the circuit breaker, said wire being mounted adjacent the transmission line;

means for producing and superimposing an alternating current signal on the grounded transmission line at a location adjacent the power supply;

current detecting means for detecting the level of the superimposed signal and producing a control signal when the current level from said alternating current signal exceeds a predetermined maximum level, which level corresponds to the presence of an illegitimate load on the power distribution system;

voltage detector means for detecting the voltage level of the superimposed signal above ground potential and producing a control signal when the voltage level of said alternating current signal in the transmission line falls below a predetermined minimum level, said level corresponding to the presence of an illegitimate load on the power distribution system; and

switch means responsive to the control signals produced by the voltage detecting means and current detecting means, said switch means being connected in series with the pilot wire whereby the circuit breaker may be opened by a control signal from the voltage or the current detecting means or by the cessation of current flow through the pilot wire.

4,296,451

ULTRA HIGH SPEED PROTECTIVE RELAY CIRCUIT

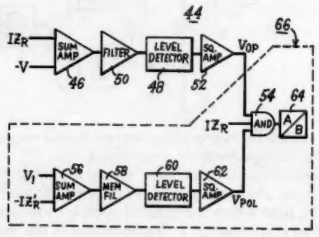
Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Dec. 31, 1979, Ser. No. 108,436

Claims priority, application United Kingdom, Oct. 11, 1979, 35313/79

Int. Cl.³ H02H *3/28*

U.S. Cl. 361—80 **18 Claims**



1. In a protective relay for one or more transmission lines in a three-phase ac power system, the relay being of a phase comparator type and including phase coincidence detecting means responsive to at least two input signals supplied thereto, one input signal being an operating signal and a second input signal being a polarizing signal, and timer circuit means responsive to an output signal from said phase coincidence detecting means when the phase coincidence of the input signals is of a predetermined duration, an improvement wherein:

a. said operating signal comprises that portion of a first difference signal which exceeds a predetermined threshold value, the first difference signal being related to the difference between (1) the product of a signal proportional to transmission line current and a replica impedance of the transmission line and (2) a signal proportional to transmission line voltage; and

b. said polarizing signal comprises that portion of a second difference signal which exceeds a predetermined threshold value, the second difference signal being related to the difference between (1) a signal proportional to a voltage representative of the transmission line voltage and (2) the product of the signal proportional to transmission line current and the replica impedance of the transmission line multiplied by a predetermined constant.

4,296,452

MULTIPHASE FAULT PROTECTION CIRCUITRY WITH VARIABLE FUNCTIONAL LEVEL DETECTION

Leif Eriksson, Sala, Sweden, and Salomon Liberman, Ra'anana, Israel, assignors to Asea Aktiebolag, Vesteras, Sweden

Continuation-in-part of Ser. No. 964,202, Nov. 28, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,388

Claims priority, application Sweden, Nov. 28, 1977, 7713411

Int. Cl.³ H02H *7/26, 3/38*

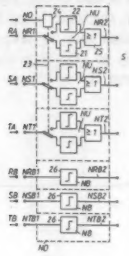
U.S. Cl. 361—82 **11 Claims**

1. Circuitry for generating tripping and blocking signals for the protection of electrical components in an electrical power supply network as a result of the occurrence of faults therein, comprising:

means for generation of respective tripping signals and

blocking signals for each phase of the electrical power supply network in dependence on whether the fault lies ahead or behind the electrical component to be protected, respectively, in response to measurement of the voltage and current associated with transient waves generated by faults in each phase of the electrical power supply network;

detection means having a predetermined operating level, for determining the presence of a first tripping signal resulting



from the occurrence of a single phase fault and the presence of a second tripping signal resulting from the occurrence of a fault in another phase, and means for changing the operating level for detection of said second tripping signal upon detection of the first tripping signal; and

means responsive to said detection means for generating respective tripping and blocking outputs for each phase of said electrical power supply network, whereby double or triple pole tripping is prevented unless the presence of said second tripping signal is detected.

4,296,453

WOUND ELECTRICAL CAPACITOR WITH EXCESSIVE PRESSURE PROTECTIVE DEVICE

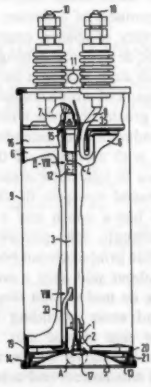
Karl Aigle; Udo Hieber, both of Heidenheim; Wilhelm Huebscher, Heldenfingen; Hans H. Rheindorf, Herbrechtingen, and Rolf Wiedemann, Nattheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 39,877

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2825377

Int. Cl.³ H01G *1/11*

U.S. Cl. 361—275 **7 Claims**



1. In a wound electrical capacitor, particularly a power capacitor, which is enclosed in a housing provided with an excess-pressure break-away structure, the combination of a hollow tubular electric conductor means mounted within the housing electrically connected to the capacitor and mechanically connected to the housing for the subjection of tension loads thereon in the presence of excessive pressure in the housing, said electrical conductor means having a localized cross-sectional reduction in material at a predetermined location which constitutes a rated break point, and reinforcing means at the break point to prevent accidental rupture of the break point except by said tension loads.

4,296,454

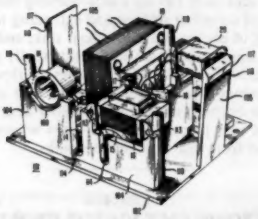
MOLDED CIRCUIT RETAINING ENCLOSURE WITH A RECEPTACLE MEANS FOR SECURING INDIVIDUAL CIRCUIT COMPONENTS

William H. Wong, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 22, 1979, Ser. No. 86,724

Int. Cl.³ H05K *7/12*

U.S. Cl. 361—380 **4 Claims**



1. An enclosure-type circuit support structure to support electrical components of a circuit including resistive and reactive devices, the circuit support structure comprising:

a base chassis structure and a retaining chassis structure joined together by interlocking apparatus which locks the two chassis structures together in order to secure the electrical components in place, the base chassis structure including a plurality of drop-in receptacles each adapted dimensionally for receiving a specific electrical component of the circuit to be supported including at least a receptacle for a reactive device, the electrical components of the circuit being inserted into the receptacles;

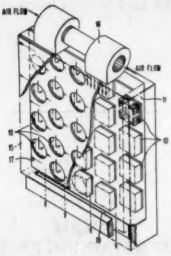
the retaining chassis structure including retaining means for applying a constraining force to the electrical components in order to secure the electrical components into assigned drop-in receptacles; and

the retaining means comprising at least a clamp nodule applying clamping pressure to at least a selected reactive device of said electrical components, the clamp nodule comprising a projecting member set in an aperture in the retaining chassis structure which is aligned with a drop-in receptacle in which the selected electrical component is situated, the projecting member being connected as a cantilever-type beam to a periphery of the aperture and including a protuberance at a free end of the projecting member, the protuberance applying clamping pressure to the selected electrical component to hold it in its drop-in receptacle.

4,296,455
SLOTTED HEAT SINKS FOR HIGH POWERED AIR COOLED MODULES

Edgar C. Leaycraft, Woodstock; Sevgin Oktay, Poughkeepsie, and Carl D. Ostergren, Montgomery, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1979, Ser. No. 96,942
Int. Cl.³ H05K 7/20
U.S. Cl. 361—383 **15 Claims**



1. An air cooling system for high density integrated circuit modules comprising:

a module containing integrated circuit chips and having a heat conductive covering surface;

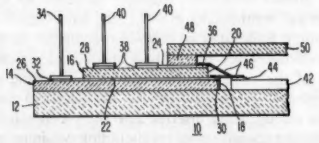
a plurality of hollow heat sinks, each having a top opening at one end and the opposite end attached to said covering surface and each having a side opening therein extending from said covering surface and extending toward said top opening of each said hollow heat sink; and

means for impingement air flow substantially parallel to each said hollow heat sink which causes air flow through said top openings of each of said hollow heat sinks and out of said side opening in each said hollow heat sink as well as between said plurality of heat sinks whereby the heat is removed from said hollow heat sinks.

4,296,456
ELECTRONIC PACKAGE FOR HIGH DENSITY INTEGRATED CIRCUITS

Gilbert R. Reid, Norristown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 2, 1980, Ser. No. 155,533
Int. Cl.³ H05K 1/14
U.S. Cl. 361—403 **7 Claims**



1. An electronic package for an integrated circuit chip having a plurality of signal pads along its periphery comprising:

a base member and at least a first and a second circuit layer, said first circuit layer being mounted on said base member and said second circuit layer being mounted on said first circuit layer, each of said circuit layers being frame-like and having a central opening, a plurality of electrically conductive chip-connection tabs disposed on a planar surface of each of said circuit layers and situated adjacent the periphery of its central opening, respective pluralities of electrically conductive pin-mounting pads and metallized lines disposed on said planar surface of each of said circuit layers, each of said lines connecting a chip-connection tab to a pin-mounting pad on a common circuit layer;

the dimensions of the central opening of said second circuit layer being greater than those of the central opening of said first circuit layer, and the area of the planar surface of said second circuit layer being less than that of said first circuit layer, whereby the chip-mounting tabs and the pin-mounting pads of said first circuit layer remain uncovered in the presence of the mounted second circuit layer;

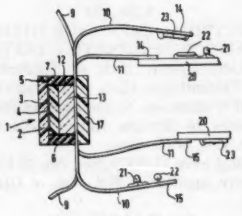
a plurality of input/output pins affixed respectively to the plurality of pin-mounting pads on each of said circuit layers;

the central openings of said circuit layers forming a well for receiving said chip, the latter being adapted to be mounted on said base member and to have said signal pads connected respectively to said chip-connection tabs on both said first and second circuit layers.

4,296,457
APPARATUS FOR ELECTRICALLY CONNECTING A PLURALITY OF CONTACTS

Günter Hahlganss, Kriftel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 106,082
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901416
Int. Cl.³ H05K 01/14
U.S. Cl. 361—413 **8 Claims**



1. Apparatus for electrically connecting a plurality of closely positioned contacts of a device, preferably a display device, with a plurality of spaced contacts of an electronic circuit controlling the device, comprising a plurality of flexible printed circuit boards each having a narrow mid-section and two outer end areas each of which is spaced from said mid-section and has a width greater than the width of said mid-section, and a plurality of conductor lines extending from said mid-section for connection with a portion of the closely positioned contacts of the device to said outer areas for connection with a portion of the spaced contacts of the electronic circuit, wherein the device has a width and a central axis passing transversely therethrough, said plurality of circuit boards including a first flexible printed circuit board having a configuration symmetrical about said axis, a second flexible printed circuit board having its mid-section disposed on one side of said axis and its end areas extending from its mid-section toward the opposite side of said axis, and a third flexible printed circuit board having its mid-section disposed on said opposite side of said axis and its end areas extending from its mid-section toward said one side of said axis, said end areas of said first, second and third flexible printed circuit boards each having the same width.

4,296,458

ELECTROLYTE CAPACITORS WITH IMPROVED ANODE-TO-LEAD CONNECTION

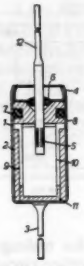
Leslie Smith, Towcester; William Tew, Stoke Bruene, and Jack Woolley, Haversham, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Nov. 20, 1978, Ser. No. 961,919

Claims priority, application United Kingdom, Nov. 24, 1977, 48885/77

Int. Cl.³ H01G 9/00; B01J 17/00

U.S. Cl. 361—433 11 Claims



1. A wet electrolyte capacitor comprising:

a can made from non-solderable valve metal,

an annular shaped cathode disposed within said can,

an anode made from non-solderable valve metal mounted substantially concentrically within said annular shaped cathode and separated therefrom by an electrolyte, contained within said can surrounding the cathode, the can being a hollow construction initially open at one end for insertion of the cathode and the anode,

an anode lead, the anode being provided with a recess for reception of said anode lead,

a seal for hermetically sealing the open end of the can, the seal including means for connecting the anode lead through the seal in electrical isolation from the can, and

a further seal within said can comprising a bung which is tightly fitted to surround the anode lead, said further seal being positioned between the anode and said seal and preventing the electrolyte from contacting the seal at least during the sealing operation,

said anode lead comprising a continuous piece of metal extending without jointing from the anode to the outside of the seal.

4,296,459

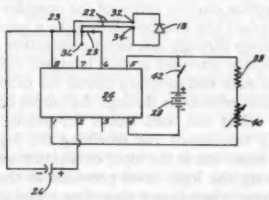
LIGHT EMITTING ELECTRONIC JEWELRY

Frederick P. DeLuca, 3520 Jewel Dr., Ames, Iowa 50010

Filed Aug. 6, 1979, Ser. No. 64,036

Int. Cl.³ F21L 15/08

U.S. Cl. 362—104 6 Claims



1. A light emitting electronic earring comprising,

an earring post adapted for securement to a wearer's earlobe,

a light emitting diode operatively supported on said post,

a battery means, and

an electrical circuit,

said light emitting diode and battery means being electrically connected in said circuit such that said light emitting diode is illuminated at times by said battery means,

said electrical circuit comprising a mercury switch electrically connected between said light emitting diode and battery means so as to make and break the electrical connection therebetween in response to movements of the wearer's earlobe,

a casing,

said battery means and mercury switch being supported in said casing,

said electrical circuit including elongated conductor chains electrically connecting said light emitting diode to said mercury switch, said casing being suspended from said post by said conductor chains.

4,296,460

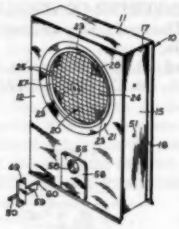
LAMPS

William E. Minoprio, Blackburn, and Arthur K. Horsfield, Preston, both of England, assignors to Dorman Smith Traffic Products Limited, Southport, England

Division of Ser. No. 833,098, Sep. 14, 1977. This application Dec. 10, 1979, Ser. No. 101,588

Int. Cl.³ F21L 7/00

U.S. Cl. 362—200 8 Claims



1. A battery-powered lamp comprising a casing in the form of a box-like body part having a top and front and rear and side walls for housing at least one battery, at least the front wall having a depression which provides a generally planar depressed portion in which an opening is disposed; a light source supported in the casing; and a lens through which light from the light source can be transmitted, which lens has a peripheral rim which is a friction fit in said opening and has, on the peripheral rim, a plurality of ratchet-like teeth which are mutually spaced around the periphery of the lens and which make snap fits with and locate behind the material of the front wall bounding the opening to resist removal of the lens from its opening.

4,296,461

BATTERY PACKAGE WITH DC TO DC CONVERTER

Henry R. Mallory, Greenwich, Conn., and Steven J. Nichols, North Tarrytown, N.Y., assignors to Duracell International Inc., Bethel, Conn.

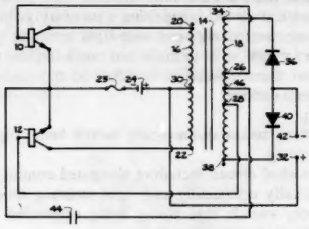
Filed Jan. 29, 1979, Ser. No. 7,456

Int. Cl.³ H02M 3/335; H01M 2/34

U.S. Cl. 363—22 10 Claims

1. A battery package comprising a casing having therein one cell of a type which is subject to damage by cell reversal, said cell having an anode comprising lithium, a DC to DC converter circuit electrically connected to said cell, and means for electrically connecting the output of said converter circuit to a load, said converter circuit comprising means to substantially prevent current flow through said converter circuit unless a load is connected to the output of said converter circuit, whereby said cell discharges only when the load is connected

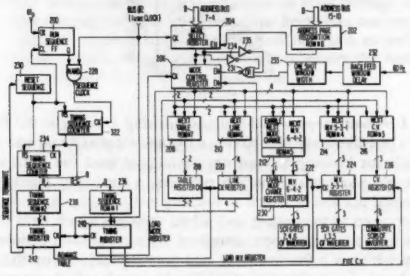
to said converter circuit, said converter circuit being adapted to provide a voltage output substantially in excess of the voltage of the one cell in said package, and said converter circuit including means to electrically prevent recharging of the cell.



4,296,462
INVERTER CONTROLLER

George P. Gurr, Dunwoody, Ga., assignor to Sangamo Weston, Inc., Atlanta, Ga.

Filed Jul. 2, 1979, Ser. No. 54,024
Int. Cl.[3] H02M 7/515
U.S. Cl. 363—96 25 Claims



1. An inverter controller for controlling the firing time and sequence of gated conduction controlled rectifiers in an inverter used for generating a pulse code signal for injection upon electrical transmission lines, which comprises:

an address bus for providing address information;

means responsive to functional commands indicative of the desired mode of operation of said inverter for providing a portion of said address information on said address bus;

first memory means responsive to said address information on said address bus for generating next address information;

first register means for receiving said next address information from said first memory means and for delivering the other portion of said address information to said address bus;

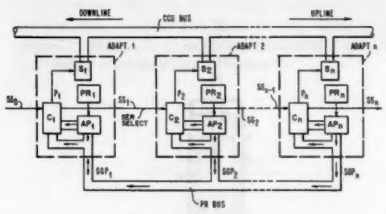
second memory means responsive to said address information on said address bus for generating next gate control signals; and

second register means for receiving said next gate control signals from said second memory means for providing signals for the gate controlled rectifiers of said inverter.

4,296,463
SELECT SYSTEM FOR PRIORITY INTERFACE CIRCUITRY

Gerard Dalboussiere, La Colle, Loup, France, and Wilburn D. Draper, Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 17, 1979, Ser. No. 39,714
Claims priority, application France, Jun. 7, 1978, 78 17709
Int. Cl.[3] G06F 3/04
U.S. Cl. 364—200 5 Claims



1. A selection system for making the selection amongst interface circuits, each interface circuit interfacing a plurality of units making service requests at different priority levels, and a central unit, said selection being carried out according to said priorities, and said system being characterized in that it includes:

a central unit bus for connecting the interface circuits to the central unit,

a priority bus having an upline and down line extent and carrying priority level information,

a group of n interface circuits connected along said priority bus and each including a preselection means comprising:

a priority request register for registering the highest priority level received from the pending requests of the units connected to the interface circuit,

an adapter priority register connected to said priority request register for receiving the contents of the said priority request register at a predetermined time,

driving means connected to the priority bus for placing on the priority bus the priority level information from the adapter priority register,

receiving means connected to the priority bus and to the driving means and providing on its output the priority level information corresponding to the service requests pending in the interface circuits upline of the said interface circuit,

comparison means receiving on its first inputs the priority registered in the adapter priority register and on its second inputs the priority level provided by said receiving means and providing on its output a logic level "1" when the priority registered in the adapter priority register for that interface has a level higher than or equal to the priority level of the request having the highest priority among the requests pending in said interface circuits upline of the considered interface,

a serial select line interconnecting the n interface circuits of the group through one input connection and one output connection provided at each interface circuit,

means at each said interface circuit for propagating a serial selection informaion through the output connection of the serial select line, said means comprising an OR circuit having two inputs one receiving the logic level of the serial select line at the input connection and the other one receiving the logic level provided at the output of the comparison means and providing on its output the serial selection information to the output connection,

a select latch for enabling connection of said interface circuit to said central unit bus, and

logic means at each of the said interface circuits responsive to the results provided by the comparison means, the

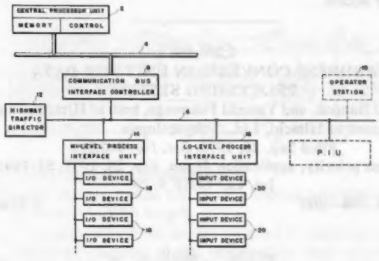
condition of the serial select line input and the presence of a select order from the central unit for setting the select latch of only one of the interface circuits and resetting the select latches of the other interface circuits whereby the said one interface circuit which has its select latch set is enabled for communication with the central unit over said central unit bus.

4,296,464

PROCESS CONTROL SYSTEM WITH LOCAL MICROPROCESSOR CONTROL MEANS

Rodney G. Woods, Glendale; Charles J. Clarke, Jr., and Robert C. Sodergren, both of Phoenix, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 3, 1977, Ser. No. 773,913
Int. Cl.³ G06F 9/22
U.S. Cl. 364—200 **18 Claims**



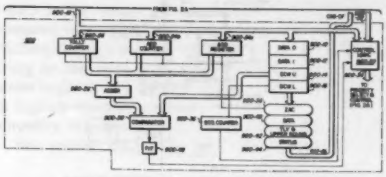
1. A process control computer system comprising:
a central processor unit as a primary controller;
said central processor including a main computer memory and a control unit;
a two conductor communication bus;
an interface control unit including direct memory access with respect to said main computer memory, said interface control unit being interconnected between said central processor unit and said communication bus;
a plurality of process data point devices including input and output devices; and
a process interface unit connected to interface between said process data point devices and said communication bus;
said process interface unit including a microprocessor unit, local memory means operative under the control of said microprocessor unit, means further controlled by said microprocessor unit for continuously gathering data from said input data point devices, means including said microprocessor unit for manipulating said gathered data in accordance with selected instructions, means under the control of said microprocessor unit for storing said manipulated data in said local memory means, said manipulated data being compared within said process interface unit with predetermined criteria stored in said local memory means to detect extra-criteria data, means for storing said extra-criteria data in said local memory means, means including said microprocessor unit for transmitting said stored extra-criteria data by way of said communication bus and said direct memory access to said central process unit while retaining said manipulated data in said local memory, said process interface unit including means for receiving from said central processor unit, by way of said communication bus, output control signals, and means including said microprocessor unit for transmitting said output control signals to designated output data point devices.

4,296,465

DATA MOVER

Nicholas S. Lemak, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Nov. 3, 1977, Ser. No. 848,172
Int. Cl.³ G06F 1/00
U.S. Cl. 364—200 **18 Claims**



1. A data mover comprising:
a data in bus;
a data out bus;
a control bus;
data register means connected to the data in bus for storing at least one data word;
control register means connected to the data in bus for storing at least one control word;
means connected to the data out bus for issuing memory read commands and memory write commands; and
control means connected to the control bus, to the data register means, and to the means for issuing memory commands for causing the means for issuing memory commands to issue a write command after issuing a read command on the data out bus only if a data word is stored in said data register means in response to a previously issued read command and to issue the data words stored in the data register means on the data out bus immediately following the issuing of write command.

4,296,466

DATA PROCESSING SYSTEM INCLUDING A SEPARATE INPUT/OUTPUT PROCESSOR WITH MICRO-INTERRUPT REQUEST APPARATUS

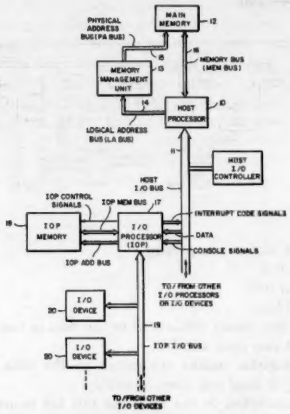
James M. Guyer, Marlboro, and Joseph T. West, Boxborough, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Jan. 23, 1978, Ser. No. 871,689
Int. Cl.³ G06F 13/00, 15/16
U.S. Cl. 364—200 **13 Claims**

1. A data processing system comprising a host processor having a microprogram control store, a host processor memory, and a host memory management unit, the contents of which permit the conversion of logical addresses received by said host processor into physical addresses for said host memory, and further comprising
an input/output processor;
input/output bus means for providing communication between said input/output processor and said host processor, said host processor being capable of generating a specified coded signal in response to any interrupt request from said input/output processor;
said input/output processor including
means for generating a micro-interrupt request signal for said host processor to request a re-allocation of a selected position of the contents of said memory management unit; and
micro-interrupt indentifying means responsive to said specified coded signal received from said host processor and to said micro-interrupt request signal of said input/output processor for providing a signal to said host processor for identifying said interrupt request as one requiring the re-allocation of said selected portion of the contents of said memory management unit, whereby said host proces-

sor can perform such re-allocation in accordance with a specified program in its micro-program control store;

said input/out processor thereby being capable of accessing said host memory and said memory management unit via said input/output bus means for the direct transfer of



logical addresses to said re-allocated selected portion of said memory management unit and for the direct transfer of data between said input/output processor and said host memory when said selected portion of said memory management unit has been re-allocated.

4,296,467

ROTATING CHIP SELECTION TECHNIQUE AND APPARATUS

Chester M. Nibby, Jr., Peabody, and William Panepinto, Jr., Tewksbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jul. 3, 1978, Ser. No. 921,292
Int. Cl.[3] G11C *13/00*
U.S. Cl. 364—200 **33 Claims**

1. At least one memory module board included in a memory subsystem, said board including a control section and a memory section having from one up to a predetermined number of physical row locations of memory chips, each row location of memory chips providing a like increment of addressable memory space, said memory section including:

a number of addressable memory chips for providing a plurality of storage locations corresponding to said increment of memory space, said chips being positioned at a predetermined one of said row locations; and,

said control section including:

register means for receiving a portion of a plurality of address signals for accessing said storage locations within said increment of memory space, predetermined address bits of said portion of said address signals being coded to specify the physical row location of chips to be accessed;

rotating selection switch means for selectively generating signals coded to specify a desired starting physical row location of said memory chips of said memory section; and,

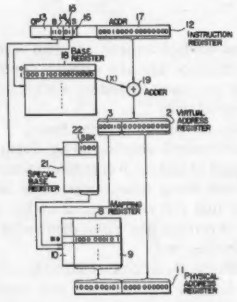
arithmetic means being coupled to receive said predetermined address bits of said portion and said coded signals from said rotating switch selection means, said arithmetic means being operative to generate logical row address signals by performing a predetermined arithmetic operation upon said predetermined address bits of said portion and said coded signals, said logical row address signals addressing said number of memory chips in said predetermined physical row location rather than a specified different physical row location when said increment of memory provided by said chips has been enabled by said portion for access.

4,296,468

ADDRESS CONVERSION UNIT FOR DATA PROCESSING SYSTEM

Tadaaki Bandoh, and Yasushi Fukunaga, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,396
Claims priority, application Japan, Sep. 26, 1977, 52/114629
Int. Cl.[3] G06F *9/20*
U.S. Cl. 364—200 **5 Claims**



1. An address conversion method for a data processing system in which a logical address is produced by processing an instruction which includes a first portion indicative of whether the instruction is a first or second kind of instruction, and in which a physical address representative of one of plural addressable storage locations in a physical memory space is produced by means of the logical address through mapping register means which store contents specifying pages of said physical memory space, said method comprising

producing the physical address by adding in the case of the first kind of instruction the contents of a first base register and the contents of an index register specified by respective second and third portions of the instruction to a fourth portion of the instruction comprising an address part of the instruction to form a logical address, addressing the mapping register means with an address corresponding to the juxtaposition of an upper bit portion of the logical address and a program status word, and then juxtapositioning the addressed contents of said mapping register means with a lower bit portion of the logical address; and

while in the case of the second kind of instruction producing

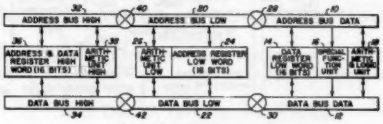
the physical address by adding the contents of the index register specified by the third portion of the instruction and the fourth portion of the instruction comprising the address part of the instruction to form a logical address, addressing a second base register with the second portion of the instruction, addressing the mapping register means with an address corresponding to the juxtaposition of an upper bit portion of the logical address and the addressed content of said second base register, and then juxtapositioning the addressed contents of said mapping register means with a lower bit portion of the logical address.

4,296,469

EXECUTION UNIT FOR DATA PROCESSOR USING SEGMENTED BUS STRUCTURE

Thomas G. Gunter; Harry L. Tredennick, both of Austin, and Doyle V. McAlister, Pflugerville, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 17, 1978, Ser. No. 961,798
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—200 **6 Claims**



1. A data processor comprising:

(a) first storage means for storing digital information of a predetermined bit length;

(b) first and second bus means coupled to said first storage means for carrying digital information, each of said first and second bus means being adapted to carry digital information of the predetermined bit length;

(c) second storage means for storing digital information of the predetermined bit length;

(d) third and fourth bus means coupled to said second storage means for carrying digital information, each of said third and fourth bus means being adapted to carry digital information of the predetermined bit length; and

(e) first and second switch means, said first switch means being coupled between said first and third bus means and being responsive to a first control signal for enabling transmission of digital information between said first and third bus means, and said second switch means being coupled between said second and fourth bus means and being responsive to a second control signal for enabling transmission of digital information between said second and fourth bus means, wherein each of said first, second, third and fourth bus means comprise pairs of differential signal conductors, each pair of differential signal conductors being adapted for carrying a true signal and a complement signal for each bit of the predetermined bit length.

4,296,470

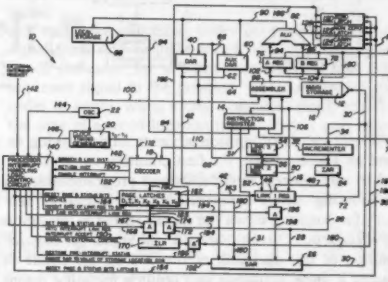
LINK REGISTER STORAGE AND RESTORE SYSTEM FOR USE IN AN INSTRUCTION PRE-FETCH MICRO-PROCESSOR INTERRUPT SYSTEM

Peter T. Fairchild, Woodstock, Ga., and Joel C. Leininger, Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 21, 1979, Ser. No. 50,570
Int. Cl.³ G06F *9/40*
U.S. Cl. 364—200 **2 Claims**

1. In an interruptable stored-program data processing system which includes a storage unit for storing instructions, an instruction register for receiving stored instructions from the storage unit, a storage address register for addressing the storage unit, an instruction address register for normally providing to the storage address register the address of the instruction which follows the instruction held in the instruction register, a stack of link registers interconnected to form a last-in-first-out stack, circuitry responsive to a branch instruction in the instruction register for providing a branch address to the storage address register and for transferring the address in the instruction address register to the link register stack, circuitry responsive to a return instruction in the instruction register for transferring the last entered instruction address from the link register stack to the storage address register, and interrupt circuitry responsive to an interrupt request from a peripheral unit for switching the data processing system to an interrupt mode and forcing an interrupt routine starting address into the storage address register, an interrupt mode control mechanism for the link register stack comprising:

circuitry responsive to store link instructions in the instruction register during the initial phase of the interrupt routine for transferring the contents of the link register stack to a predetermined save area in the storage unit;



monitoring circuitry responsive to branch instructions and return instructions in the instruction register during the interrupt mode for monitoring the usage of the link register stack by the interrupt routine for producing a stack emply signal when no interrupt routine link addresses are pending in the stack;

circuitry responsive to load link instructions in the instruction register during the final phase of the interrupt routine for transferring the previously saved link register contents from the storage unit back to the link register stack;

and circuitry responsive to the stack empty signal and to a return instruction in the instruction register at the end of the interrupt routine for switching the data processing system back to the normal operating mode.

4,296,471

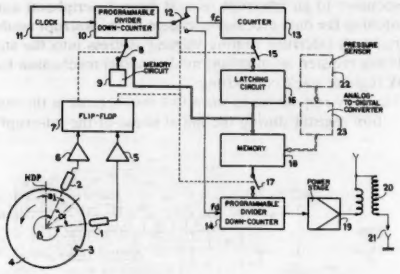
DEVICE FOR INITIATING IN PARTICULAR THE IGNITION OF AN INTERNAL COMBUSTION ENGINE

Jacques Goux, Limours, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Jun. 5, 1979, Ser. No. 45,770
Claims priority, application France, Jun. 8, 1978, 78 17157
Int. Cl.³ F02P *5/04*
U.S. Cl. 364—424 **5 Claims**

1. Device for initiating, in particular the ignition of an internal combustion engine, said device comprising means for measuring the speed of rotation of the engine which comprise a disc for fixing to the shaft of the engine, a first sensor and a second sensor associated with the disc and offset from each other by a predetermined angle, a reference element carried by the disc and movable in front of the sensors, and means for initiating the ignition as a function of the measured speed of rotation, said means for measuring the speed of rotation further comprising a first programmable divider down-counter having an output and an input, a clock connected to said input for delivering thereto signals at a frequency f_o, a first counting

means connected to said output for counting the signals delivered by the programmable divider down-counter, the frequency f_c of said signals delivered by the first programmable divider down-counter being equal to the frequency fo of the clock signals divided by the value of the angle β equal to the difference between 360° and the angle α of the offset between the first sensor and the second sensor, a first memory containing different values of ignition advance angles having an output and an address input, the first counting means being connected to said address input, a second programmable divider down-counting means connected to said output of the first memory for counting down the signals stored in the first memory at a frequency corresponding to one signal per angular unit of rotation of the disc and, at the end of the count down, producing a signal actuating said ignition initiating means.

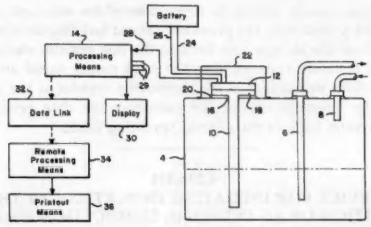


4,296,472

NON-INTRUSIVE FLUID MEASURING SYSTEM

Barkhoudarian Sarkis, Madison Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1979, Ser. No. 80,556
Int. Cl.³ G01F *23/26*
U.S. Cl. 364—509 **34 Claims**



1. A fluid meter system with a fluid tank for use in fluid measurements such as consumed fluid, remained fluid, or flow rate comprising:

(a) a capacitive probe including first and second electrodes, means for securing said electrodes in a spaced-apart relationship and means for securing said electrodes in said fluid tank,

(b) circuit means electrically connected to said first and second electrodes for providing signal pulses representative of the capacitance of said probe,

(c) microprocessor means for receiving and processing said signal pulses including:

(i) program memory storage means,

(ii) data memory storage means,

(iii) a central processing unit operable in accordance with a program of said program memory storage means for calculating from said received signal pulses data signals corresponding to said fluid measurements, and

(iv) means for storing said fluid measurements in said data storage means, and

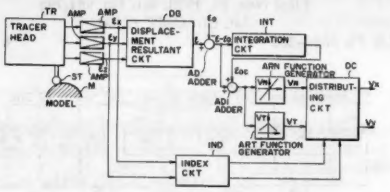
(d) means for outputting said stored data signals for providing an indication of same.

4,296,473

PROFILE CONTROL SYSTEM

Ryoji Imazeki, and Etuo Yamazaki, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Mar. 23, 1979, Ser. No. 23,459
Claims priority, application Japan, Mar. 23, 1978, 53-33397
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—520 **4 Claims**



1. In a profile control system in which an error signal, based on the difference between the displacement ϵ relative to a tracer head of a stylus tracing a model with friction therebetween, and a predetermined reference signal ϵ_0, is applied to a command velocity function generator and a correcting velocity function generator to produce a command velocity signal and a correcting velocity signal, and in which a displacement direction signal from an index circuit and the command and correcting velocity signals are provided to a distributing circuit to derive therefrom respective axis command velocity signals for profile control, said axis command velocity signals having error as a result at least of said friction, the improvement comprising:

integrating means for integrating a difference signal ϵ-ϵ_0 between said displacement ϵ of the stylus and said reference signal ϵ_0 to obtain an integrated value ϵ_{0c}, and

means for applying a signal corresponding to the sum of the integrated value ϵ_{0c} and the difference signal ϵ-ϵ_0 as the error signal to said command and correcting velocity function generators for at least partially compensating for said error in said axis command velocity signals.

4,296,474

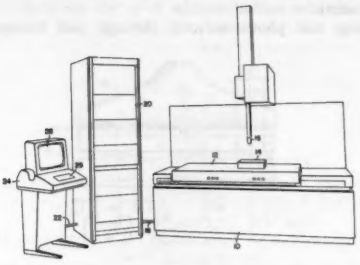
INSPECTION SYSTEM AND APPARATUS THEREFOR

James J. Hurt, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 830,412, Sep. 6, 1977, abandoned. This application Dec. 10, 1979, Ser. No. 102,016
Int. Cl.³ G06F *15/46*; G05D *5/00*
U.S. Cl. 364—560 **10 Claims**

1. An inspection system comprising: a coordinate measuring machine for providing actual data signals representative of actual feature coordinates on a part being inspected relative to an arbitrary coordinate system; data input means for providing nominal data signals representative of nominal feature coordinates on the part relative to a predetermined coordinate system; a data processor responsive to the nominal and actual data signals to process the actual data signals to provide true position data signals representative of the actual feature coordi-

nates repositioned to most closely correspond to the nominal feature coordinates in the predetermined coordinate system;



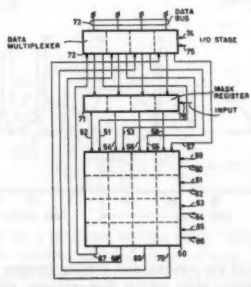
and data output means responsive to the true position data signals to provide an output representative thereof.

4,296,475

WORD-ORGANIZED, CONTENT-ADDRESSABLE MEMORY

Leendert Nederlof, Eindhoven, Netherlands, and Roelof H. W. Salters, Sunnyvale, Calif., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1978, Ser. No. 970,883
Int. Cl.³ G11C *15/04*
U.S. Cl. 364—900 **9 Claims**



1. A content-addressable memory having a matrix of bit cells for accommodating a plurality of multibit words on an integrated circuit, said integrated circuit comprising:

a first input for inputting a key word, a second input for inputting a mask word for the selective deactivation of a part of the input key word by masking, and an output for outputting a data word stored in a word location;

first means for comparing a non-masked part of a key word with a corresponding part of a data word stored in a word location;

second means for indicating, for each word location, correspondence detected by said first means and for activating said output for outputting data from a word location for which correspondence occurs, wherein said second means comprise a validity indicator for each word location, having a state "valid" and a state "invalid", for selectively indicating the validity of the word stored at this location, and for each word a correspondence indicator, having a state "correspondence" and a state "non correspondence", said validity indicator acting as a bit position of the associated word location, so that when the memory is addressed as regards valid word location content, said state "invalid" blocks the associated correspondence indicator for the effective supply of a signal "correspondence", each validity indicator comprising a switch input for selectively setting the indicator, by an externally applied switch signal, to the one or to the other state;

third means for clearing a part of the memory and for switching, under the control of a correspondence signal from the correspondence indicator of one or more word locations, the validity indicator of said one or more word locations to the state "invalid";

a multiple match resolver for forming, in the case of simultaneous appearance of at least two active "correspondence" signals, a sequence for accessing the associated word locations, wherein for the writing of a data word in a word location, the bit position corresponding to the data of the validity indicator remains exclusively unmasked by the mask word in order to control, in the position "invalid", the associated correspondence indicator so as to form a position "correspondence", after which the multiple match resolver controls a write enable signal for a single word location thus provided with a correspondence signal;

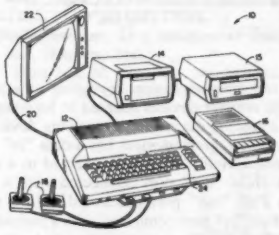
fourth means for switching, under the control of a sequence signal from said multiple match resolver, the correspondence indicator for a word location indicated by said sequence signal to the position "non-correspondence" in order to apply, when a read command signal is received, the data of a word location to said output only once.

4,296,476

DATA PROCESSING SYSTEM WITH PROGRAMMABLE GRAPHICS GENERATOR

Steven T. Mayer, Auburn; Jay G. Miner, Sunnyvale; Douglas G. Neubauer, Santa Clara, and Joseph C. Decuir, Mountain View, all of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 8, 1979, Ser. No. 1,497
Int. Cl.³ G06F *3/153*
U.S. Cl. 364—900 **18 Claims**



1. In a data processing system including a microprocessor, memory means having a plurality of addressable memory locations for storing microprocessor instructions, display instructions, and display graphics information, and a display unit of a type utilizing an image forming beam to form a raster of horizontal scan lines for displaying said graphics information to a user, said display instructions being stored in sequential ordered relation and including operation codes for defining first display characteristics of said graphics information and starting addresses indicative of the memory locations at which said graphics information is located, a graphics generator for executing said display instructions and, in response thereto, for selectively transferring portions of said display graphics information to said display unit for viewing, the generator comprising:

(a) first memory addressing means coupled to said memory means for sequentially accessing therefrom said display instructions;

(b) an instruction register coupled to said memory means for receiving and temporarily storing the operation code of each accessed instruction;

(c) second memory addressing means coupled to said memory means;

(d) control means coupled to said instruction register and responsive to the contents thereof for providing first control signals to cause transfer of said starting addresses from said memory means at memory locations designated by said first memory addressing means to said second addressing means and for causing said second memory addressing means to sequentially access said graphics information in synchronism with said image forming beam;

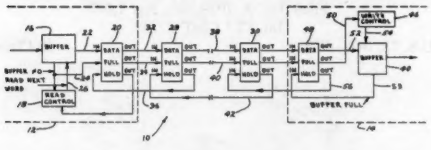
(e) transfer means coupled to said memory means and responsive to the contents of said instruction register for receiving and converting said display graphics information to video data of a format defined by said operation code, said transfer means including first buffer storage means for containing information indicative of a plurality of second display characteristics of said graphics information and selection means responsive to said video data for selecting a predetermined one of said plurality of second display characteristics, said buffer storage means being coupled to and addressable by said microprocessor for the transfer thereto of said display characteristic information.

4,296,477

REGISTER DEVICE FOR TRANSMISSION OF DATA HAVING TWO DATA RANKS ONE OF WHICH RECEIVES DATA ONLY WHEN THE OTHER IS FULL

Maurice L. Hutson, Vadnais Heights, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 19, 1979, Ser. No. 95,698
Int. Cl.³ G06F *13/00*; G11C *19/00*
U.S. Cl. 364—900 **31 Claims**



6. A data transmission system consisting of a plurality of identical ripple register devices adapted to be connected serially between a sending device and a receiving device in which each of said ripple register devices has a data "in" port and a data "out" port, a Hold "in" port connected to a succeeding device and a Hold "out" port connected with a preceding device and a Full "out" port connected with a succeeding device and a Full "in" port connected with a preceding device wherein said Full "out" port transmits information that the particular ripple register device is prepared to transmit data and wherein said Hold "out" port transmits information that the particular ripple register device cannot receive data, wherein each particular ripple register device has at least two data registers so that data may be both received and transmitted simultaneously in response to independent signals at the Full "in" and Hold "in" ports.

4,296,478

READOUT OF ELECTROSTATICALLY STORED INFORMATION

Helmut G. Kiess, Niedersteinmaur, and Bruno K. Binggeli, Arni, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

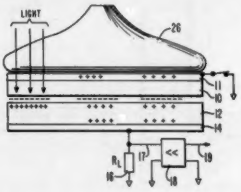
Filed Oct. 12, 1979, Ser. No. 84,394
Int. Cl.³ G11C *11/23*
U.S. Cl. 365—112 **6 Claims**

1. A method of producing an electrical signal representing a charge pattern on an insulating dielectric film, without destroying the charge pattern, comprising

placing a transparent electrode on the free top surface of said dielectric film,

placing the insulating dielectric film having the charge pattern in close contact with the free surface of an uncharged photoconductor having a back electrode connected through a signal output impedance to a point of reference potential,

scanning said photoconductor through said transparent



electrode and said dielectric film with a flying spot of light to produce a video electrical signal across said impedance during said scanning, and

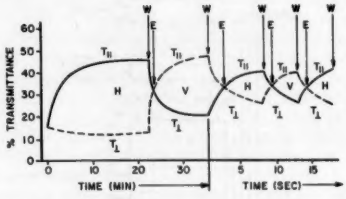
removing the dielectric film from the photoconductor, whereby the original charge pattern on the dielectric film is retained.

4,296,479

METHOD FOR OPTICAL RECORDING IN PHOTO-DICHROIC GLASS SURFACES

Che-Kuang Wu, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 15, 1979, Ser. No. 94,364
Int. Cl.³ G11C *13/04*
U.S. Cl. 365—119 **6 Claims**



1. In a method for writing and erasing images in the surface of a photosensitive glass which demonstrates alterable photo-anisotropic effects wherein an image is written into the surface of said glass through exposure thereof to a beam of linearly-polarized red light having a wavelength between about 600–650 nm and said image is erased from the surface of said glass through exposure thereof to a beam of linearly-polarized red light having a wavelength between about 600–650 nm and having a different orientation of polarization, the improvement comprising erasing said image with a beam of linearly-polarized red light having a wavelength between about 600–650 nm but with about a 45° change in the direction of polarization from said writing beam.

4,296,480

REFRESH COUNTER

Sargent S. Eaton, Jr., and Paul R. Schroeder, both of Colorado Springs, Colo., assignors to Mostek Corporation, Carrollton, Tex.

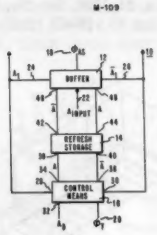
Filed Aug. 13, 1979, Ser. No. 66,149
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—222 **16 Claims**

1. An n-bit address refresh counter comprising:

an address buffer for each address bit adapted to receive an address buffer strobe for inverting a pair of complementary input signals and placing the inverted signals onto a pair of output terminals;

a refresh address storage circuit for each address buffer connected to the address buffers for storing and providing the pair of complementary input signals; and

n−1 decoders for n−1 address buffers wherein the ith



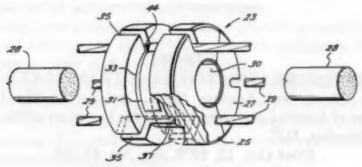
decoder receives a transfer clock signal and at least i address bits, where i=1, 2 . . . , N−1 and controls the transfer of the inverted signals on the pair of output terminals of the ith address buffer to an input of its corresponding refresh storage circuit.

4,296,481

STREAMER BULKHEAD

Benjamin F. L. Weiss, Houston, Tex., assignor to Exploration Company, Houston, Tex.

Filed Dec. 17, 1979, Ser. No. 104,168
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—20 **9 Claims**



5. Bulkhead for a streamer section comprising

a two sector annulus adapted to receive an electrical conductor bundle adapted to extend therethrough, said annulus including a major sector of greater than 180 degrees arcuate extent and a correlative minor sector of less than 180 degrees arcuate extent,

said annulus having an annular groove in its outer periphery, said annular groove being adapted to receive a girth cinch to hold said sections together,

said annulus having a plurality of radial slots in its outer periphery adapted to receive tension lines adapted to extend therethrough,

each sector having planar sides disposed at an angle to each other,

said planar sides of one sector being engaged with the adjacent planar sides of the other sector.

4,296,482

PARAMETRIC ARRAY DOPPLER SONAR APPARATUS

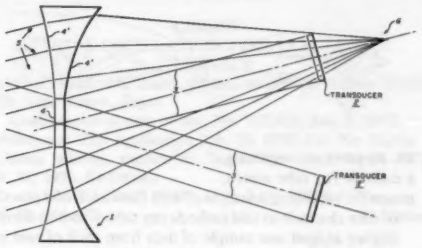
Jacob A. Kritz, Westbury, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,158
Int. Cl.³ G01S *15/60*
U.S. Cl. 367—91 **12 Claims**

1. Parametric array Doppler sonar apparatus comprising a plurality of piston-type transducers, each being positioned to launch and receive acoustic energy along a different specified axis, means to energize each transducer during specified time intervals with a signal comprising a combination of first and second primary excitation frequencies,

a hybrid acoustic lens having a central disk shaped portion and an annular ray-converging portion surrounding said central portion,

each of said transducers having a diameter sufficiently large to launch a substantially collimated acoustic beam along



the axis of that transducer and being oriented to direct the collimated beam through the central portion of said lens,

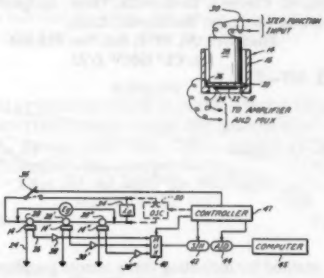
each of said transducers being further positioned within the focal region of the converging portion of said lens so as to intercept substantially all of the acoustic energy reflected from a remote target and passing through the lens along the axis of that transducer.

4,296,483

METHOD AND MEANS FOR MEASURING GEOPHONE PARAMETERS

Harry K. Haill, Houston, Tex., assignor to Litton Resources Systems, Inc., Houston, Tex.

Filed Jun. 30, 1980, Ser. No. 164,622
Int. Cl.³ G01V *13/00*
U.S. Cl. 367—13 **8 Claims**



1. A device for substantially simultaneously testing the respective active elements of a plurality of electrically interconnected geophones that generate a signal output in response to a mechanical input and that will generate a mechanical output in response to a signal input, comprising:

means for applying a signal input in series to said active elements;

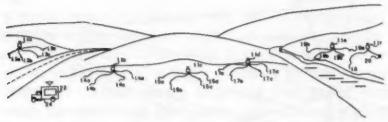
means for detecting the resultant mechanical force outputs of said geophones; and

means for sequentially determining selected characteristics of the individual active elements from the detected mechanical force outputs.

4,296,484
DATA DISPLAY SYSTEM

Terry A. Miller, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1978, Ser. No. 955,842
Int. Cl.[3] G01V *1/22, 1/34*
U.S. Cl. 367—71 23 Claims



19. Apparatus comprising:

a cathode ray tube screen;

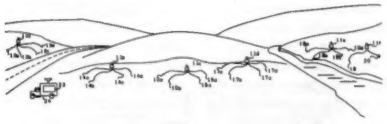
means for supplying a sample of data from each of a plurality of data channels to said cathode ray tube screen to thereby display at least one sample of data from each of said plurality of data channels, on said cathode ray tube screen, in such a manner that all samples of data displayed on said cathode ray tube screen at any one time are displayed in an alternating sequence in a horizontal pattern across said cathode ray tube screen with no sample of data being displayed directly above or below another sample of data and in such a manner that each particular sample of data is displayed with respect to the data channel from which that particular sample of data was provided; and

means for controlling the display of data on said cathode ray tube screen so as to spread the display of said at least one sample of data from each of said plurality of data channels across substantially the entire screen of said cathode ray tube.

4,296,485
TILT ALARM IN A SEISMIC EXPLORATION SYSTEM

Lawrence G. Clemens, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1978, Ser. No. 955,904
Int. Cl.[3] G01V *1/22*
U.S. Cl. 367—77 8 Claims



5. A method for indicating that a remote geophone monitoring means has been tilted with respect to a desired position of said remote geophone monitoring means comprising the steps of:

sensing that said remote geophone monitoring means has been tilted with respect to a desired position of said remote geophone monitoring means and generating an enabling signal when said remote geophone monitoring means is tilted;

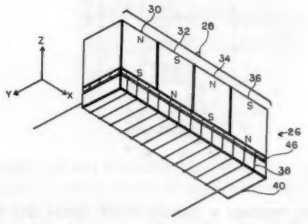
generating a tilt alarm signal in response to said enabling signal; and

automatically transmitting said tilt alarm signal from said remote geophone monitoring means to a central control station to thereby provide an indication that said remote geophone monitoring means has been tilted.

4,296,486
SHIELDED ELECTROMAGNETIC ACOUSTIC TRANSDUCERS

Carmine F. Vasile, Huntington, N.Y., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 24, 1980, Ser. No. 114,862
Int. Cl.[3] H04R *15/00*
U.S. Cl. 367—140 13 Claims



1. An electromagnetic acoustic transducer for use near a surface of an electrically conductive object, comprising:

a source of magnetic flux for establishing a static magnetic field in said object;

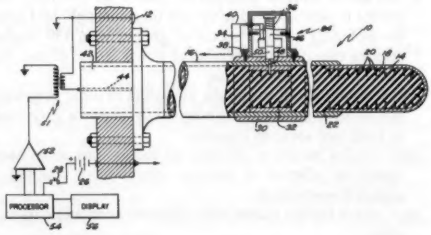
an electrical conductor disposed between said source of magnetic flux and said surface and proximate to said surface for conducting an alternating current in said static magnetic field; and

a thin, electrically conductive, nonmagnetic shield disposed between said source of magnetic flux and said conductor.

4,296,487
PRESSURE SENSITIVE LINE TRANSDUCER

Milton Green, New London, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1979, Ser. No. 87,285
Int. Cl.[3] G01V *1/16, 1/38*
U.S. Cl. 367—169 4 Claims



1. A line transducer for sensing pressure variations due to acoustic waves generated by an acoustic source comprising:

an elongated cable including a pressure sensitive electrical core element generating electrical signals in response to said acoustic waves of said acoustic source, said electrical core element of said elongated cable is an electrically conducting rubber that is insulated for preventing flow of electric current between said electrically conducting core element and a medium around said line transducer;

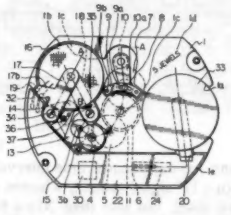
means for isolating said electrical signals from ambient noise including a solenoid for shorting an internal cladding of said elongated cable and an external cladding thereof; and

means for processing said electrical signals.

4,296,488
WATCH MOVEMENT CONSTRUCTION

Yasuaki Nakayama, Hanno, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jun. 22, 1978, Ser. No. 918,010
Claims priority, application Japan, Jun. 28, 1977, 52/77029; Nov. 24, 1977, 52/141033; Dec. 21, 1977, 52/153715
Int. Cl.³ G04B *19/04*; G04C *23/02*
U.S. Cl. 368—80 34 Claims

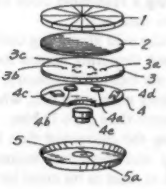


1. A movement construction for an electronic wristwatch driven by a stepping motor powered by a battery, comprising:
a base plate having a first cutout formed in close proximity to one portion of an outer periphery of said base plate to accommodate therein said battery, and a second cutout formed in close proximity to another portion of the outer periphery of said base plate;
a disk type driving coil forming part of said stepping motor and disposed in said second cutout of said base plate, said disk type driving coil having its upper and lower end surfaces substantially aligned on the same plane as upper and lower surfaces of said base plate;
a wheel train mounted on said base plate in an area between said battery and said driving coil in a manner to be concentric with said driving coil; and
a circuit board having an IC chip and a quartz crystal vibrator mounted in horizontal spaces, respectively, and supported by said base plate outside an area occupied by said driving coil, said battery and said wheel train which are aligned in a single plane.

4,296,489
ELECTRONIC TIMEPIECE

Hiromitsu Mitsui, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 678,339, Apr. 19, 1976, abandoned. This application Apr. 25, 1979, Ser. No. 33,277
Claims priority, application Japan, Apr. 17, 1975, 50-46728
Int. Cl.³ G04B *1/00*
U.S. Cl. 368—205 1 Claim

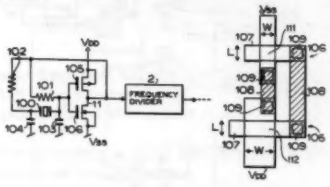


1. In an electronic timepiece including timekeeping circuitry having a solar battery for producing charging current in response to light being incident thereon, the improvement comprising said solar battery being formed of a plurality of solar cells, said solar cells being disposed on a surface of said timepiece, a circuit substrate including leads formed thereon for coupling said solar cells to said timepiece circuitry, and a conductive adhesive layer for physically securing said solar cells to said circuit substrate and for electrically coupling each of said solar cells to the leads on said circuit substrate, said conductive adhesive layer being conductive in a first predetermined direction perpendicular to the opposed surface thereof in contact with said solar cells and as an electrical insulator in the direction parallel to said opposed surface thereof.

4,296,490
CRYSTAL OSCILLATION-TYPE ELECTRONIC TIMEPIECE

Yasuhiko Nishikubo, Iruma, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 757,025, Jan. 5, 1977, abandoned. This application Feb. 23, 1979, Ser. No. 14,641
Claims priority, application Japan, Jan. 14, 1976, 51-2073; Oct. 21, 1976, 51-140664
Int. Cl.³ G04C *19/00, 3/00, 5/00*; H03B *5/30*
U.S. Cl. 368—87 11 Claims



1. A crystal oscillation-type electronic timepiece comprising an oscillator having a crystal oscillator with an input and an output as a time base, means for dividing the frequency of the oscillator, display driving means connected to said frequency dividing means, time display means connected to said display driving means, said oscillator having a complementary metal oxide simiconductor logic circuit having an inverter with a gated N-channel transistor and a gated P-channel transistor, said gated N-channel transistor having a channel with a width-/length ratio of less than one, said gated P-channel transistor having a channel with a width/length ratio of less than two, an input capacitor with a given capacitance connected to the input of the crystal oscillator and an output capacitor having a capacitance less than the given capacitance of said input capacitor connected to the output of the crystal oscillator.

4,296,491
INFORMATION CARRIER HAVING INTER-TRACK IDENTIFICATION CODE INFORMATION

Jonathan A. Jerome, Palo Alto, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 30, 1979, Ser. No. 61,794
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—59 8 Claims

1. Information-containing apparatus comprising:
(A) a substrate;
(B) a recording medium deposited on said substrate;
(C) a plurality of discrete signal data-containing tracks recorded in said medium;
(D) a discrete address code representative of each of said data-containing tracks recorded at a preselected position

in said medium and in line with said data-containing track with which the discrete address code is associated, said address codes all appearing within a predetermined region in said medium; and

(E) an index code recorded in said medium and disposed in a direction laterally of said data-containing tracks and between adjacent address codes, said index code being representative of the location on said medium at which it is recorded.

4,296,492

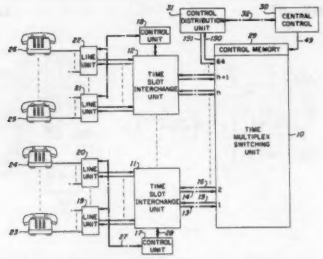
CONTINUITY VERIFICATION ARRANGEMENT

Edward H. Hafer, Winfield, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 26, 1979, Ser. No. 106,393

Int. Cl.³ H04J 3/12

U.S. Cl. 370—14 **11 Claims**



1. A continuity verification arrangement for verifying continuity of communication paths through a time division switching means comprising a first communication unit, a second communication unit, a time division switching means comprising means for generating communication path identity signals and means responsive to said communication path identity signals for completing a communication path between said first and said second communication units characterized in that

said time division switching means further comprises means for transmitting to said first and said second communication units said communication path identity signals;

said first communication unit comprises means responsive to said communication path identity signals for transmitting a unique character on said communication path; and

said second communication unit comprises receive means for receiving from said communication path said unique character transmitted by said originating unit, and continuity indicating means for generating continuity signals when said unique character is received on said communication path.

4,296,493

METHOD OF AND ARRANGEMENT FOR REGENERATING START-STOP SIGNALS

Robert Bodart, and Jean P. A. R. J. Werts, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

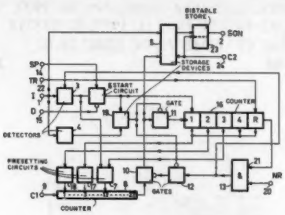
Filed Sep. 12, 1979, Ser. No. 75,049

Claims priority, application Netherlands, Sep. 13, 1978, 7809299

Int. Cl.³ H04L 5/24

U.S. Cl. 370—48 **2 Claims**

1. A method of regenerating start-stop signals having a stop polarity which is maintained for a certain period of time T after a start-stop transition, T being either greater than or equal to a minimum value, or greater than or equal to a minimum value and smaller than or equal to a maximum value, and of converting the regenerated signals into isochronous output signals, wherein the method includes taking signal samples of the start-stop signals at consecutive sampling instants by means of a regeneration process initiated by the start-stop transition, consecutively storing said signal samples in a storage device and reading out the stored signal samples at isochronous instants for forming the isochronous output signals, characterized in that the method comprises taking the signal samples at



sampling instants having unequal time intervals between them such that the $(n+1)^{st}$ signal sample, wherein $n \geqq 7$, is taken at more than 20·n msec. but less than 20·n+5 msec. after the start-stop transition.

4,296,494

ERROR CORRECTION AND DETECTION SYSTEMS

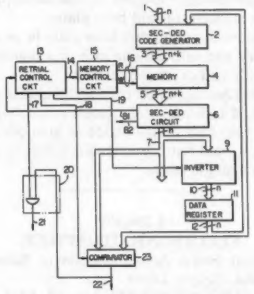
Sakou Ishikawa; Yutaka Watanabe, and Katsuro Wakai, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1979, Ser. No. 84,452

Claims priority, application Japan, Feb. 7, 1979, 54-12275

Int. Cl.³ G06F 11/10

U.S. Cl. 371—13 **10 Claims**



1. An error correction and detection system for detecting and correcting, at most, an m-bit error and for detecting a greater than (m+1)-bit error where $m \geqq 1$, using a Hamming code comprising:

means for generating a Hamming code by adding a number of redundant bits to data bits;

a memory for storing said Hamming code;

error correcting and detecting means for checking the Hamming code read out from said memory, to thereby correct an error encompassing at most m bits, while detecting an error encompassing more than (m+1) bits;

means for inverting the corrected data bits output from said error correcting and detecting means in response to the detection of said at most m bit error by said error correcting and detecting means;

means for transferring said data bits, subsequent to said inversion, to said Hamming code generating means;

a data register for temporarily storing said inverted data bits as first data bits;

means for controlling said inverting means and said memory in response to the detection of said m-bit error in said error correcting and detecting means, to transfer the first data bits

to said Hamming code generating means, to obtain output data bits as second data bits from said error correcting and detecting means;

means for comparing said first data bits from said data register with said second data bits; and

means for indicating a miscorrection which has been made by said error correcting and detecting means in response to the result of the comparison by said comparing means.

4,296,495

DEVICE FOR MEASURING THE QUALITY OF A DIGITAL RADIO LINK

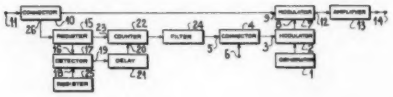
Jacques Bursztejn, Paris, France, assignor to Thomson CSF, Paris, France

Filed Oct. 24, 1979, Ser. No. 88,098

Claims priority, application France, Oct. 31, 1978, 78 30848

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—22 **6 Claims**



1. A device for measuring the quality of a digital radio link comprising transmission means and reception means respectively for transmitting a digital information signal and for receiving said transmitted digital information signal, said transmission means comprising means for generating parity bits for sequences of n successive bits of information in said digital information signal; control means determining the beginning of said sequences and means for transmitting with said information signal at least part of said parity bits; said receiving means comprising detection means for detecting the transmitted parity bits, means for generating parity bits for sequences of n successive bits of information in said digital information signal received, control means determining the beginning of said sequences, and comparing means for comparing the transmitted parity bits and the generated parity bits; said control means in said receiving means comprising means for bit by bit recognition of any sequence of k predetermined bits forming a reference sequence, k being smaller than n, and supplying a control signal to said means for generating parity bits.

4,296,496

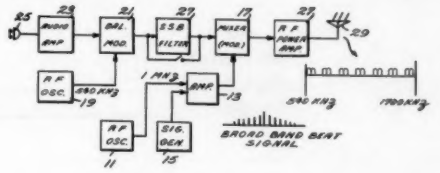
EMERGENCY RADIO FREQUENCY WARNING DEVICE

William S. Sadler, 2000 Fernwood Ave., St. Paul, Minn. 55113

Continuation of Ser. No. 674,727, Apr. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 485,761, Jul. 3, 1974, Pat. No. 3,949,300. This application Nov. 28, 1978, Ser. No. 964,152

Int. Cl.³ H04K *3/00*; H04B *1/02*

U.S. Cl. 455—1 **9 Claims**



1. A radio frequency warning device for communicating with an AM radio receiver adapted to receive signals on any one of a plurality of AM broadcast carrier frequencies comprising:

means for generating a signal having components ranging across a broad frequency band;

means for generating an R-F signal;

means responsive to an audio frequency signal and said R-F signal for causing the generation of a suppressed carrier modulation signal;

means for modulating said suppressed carrier modulation signal and said broad band frequency signal to thereby generate a broad band AM radio interference signal having respective components at frequencies simulating sidebands to each of said plurality of AM broadcast carrier signals; and

means for transmitting said broad band interference signal, said broad band interference signal generating an intelligible audio signal when received by said AM radio receivers tuned to any of said plurality of carrier frequencies.

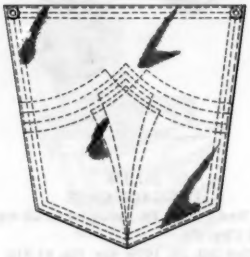
DESIGN PATENTS

GRANTED OCT. 20, 1981

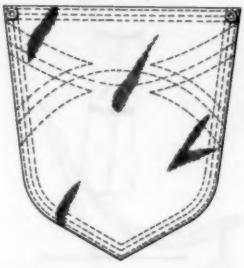
ERRATA

For CLASS	See PATENT NO.
D32–058	261,350
D34–033	261,377

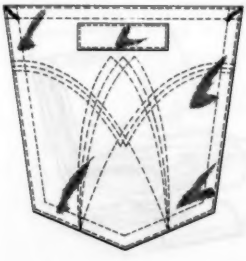
261,320
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Jan. 29, 1980, Ser. No. 116,423
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25



261,322
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Jan. 29, 1980, Ser. No. 116,427
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25



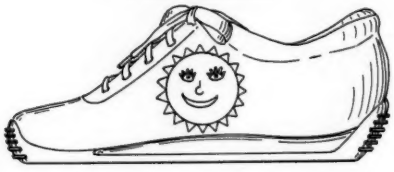
261,321
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Jan. 29, 1980, Ser. No. 116,425
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25



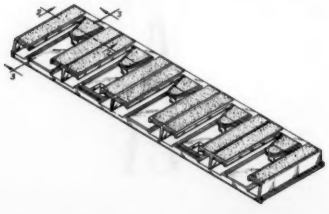
261,323
JEANS OR THE LIKE
George W. Catron, Sacramento, Calif., assignor to Leo R. LeSueur, Carmichael, Calif.
Filed Aug. 8, 1979, Ser. No. 64,856
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

261,324
JEANS OR THE LIKE
George W. Catron, Sacramento, Calif., assignor to Leo R. LeSueur, Carmichael, Calif.
Filed Aug. 8, 1979, Ser. No. 64,857
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

261,325
SHOE
Brian G. Niro, 1005 Arlington Heights Road, Arlington Heights, Ill. 60004
Filed Mar. 17, 1980, Ser. No. 131,217
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

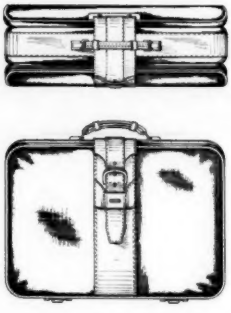


261,326
TAPE CASSETTE HOLDER FOR A SUNVISOR
Ted A. Bell, and Timothy S. Cooksey, both of Coshocton, Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Oct. 9, 1979, Ser. No. 82,828
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



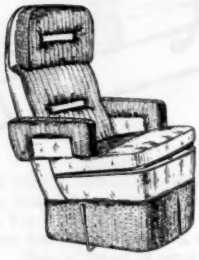
261,327
SKI CARRIER
Tommy D. Raye, 976 Welch Ct., Golden, Colo. 80401
Filed Aug. 1, 1977, Ser. No. 820,801
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—36

261,328
LUGGAGE CASE
Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 30, 1979, Ser. No. 61,816
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

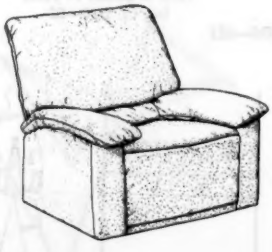


261,329
CHAIR
Robert L. Van Horn, 8165 University Blvd., Des Moines, Iowa 50311
Filed May 7, 1979, Ser. No. 36,408
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

261,330
CHAIR
Louis M. Meier, Dubuque, Iowa, assignor to Flexsteel Industries, Inc., Dubuque, Iowa
Filed May 3, 1979, Ser. No. 35,500
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

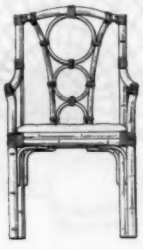


261,331
ADJUSTABLE LOUNGE CHAIR OR SIMILAR ARTICLE
Rolf Benz, Haiterbacher Strasse 104, 7270 Nagold, Fed. Rep. of Germany
Filed Jul. 11, 1979, Ser. No. 56,712
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, MR 550-NA
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

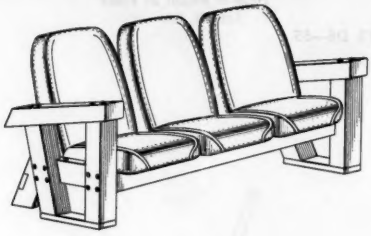


261,332
CHAIR
Eduard Rohr, Mägenwil, Switzerland, assignor to Wibe Treuhand AG, Sarmenstorf, Switzerland
Division of Ser. No. 675,302, Apr. 9, 1976.
Filed Feb. 9, 1978, Ser. No. 876,426
The portion of the term of this patent subsequent to Nov. 21, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—55

261,333
CHAIR OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Aug. 28, 1979, Ser. No. 70,443
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840125
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

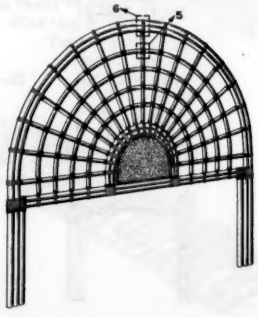


261,334
SEAT
Rex E. Light, 2836 Broadway, Fort Wayne, Ind. 46807
Filed May 19, 1978, Ser. No. 907,782
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—63

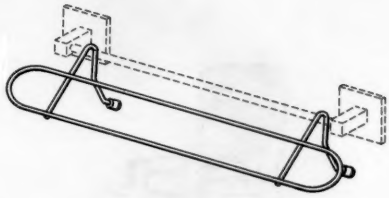


261,335
CHAIR
Marjorie M. Conner, New York, N.Y., assignor to Trigere, Inc., New York, N.Y.
Filed Aug. 14, 1979, Ser. No. 66,426
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

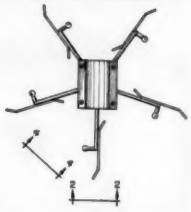
261,336
BED HEADBOARD
Robert Thorpe, 2400 W. Coast Hwy. #H, Newport Beach, Calif. 92663
Filed Mar. 6, 1980, Ser. No. 127,823
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79



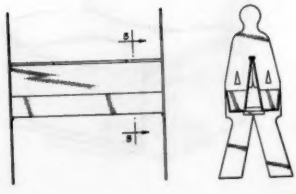
261,337
AUXILIARY TOWEL RACK
Raymond W. Fink, Maple Heights, Ohio, assignor to Tool Dynamics, Inc., Bedford Hts., Ohio
Filed Dec. 26, 1979, Ser. No. 106,756
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99



261,338
ROTATABLE TIE RACK
Grover A. Miller, 6307 Everest Way, Sacramento, Calif. 95842
Filed Jun. 11, 1979, Ser. No. 47,365
Term of patent 14 years
Int. Cl. D6—*04*; D8—*08*
U.S. Cl. D6—113



261,339
DISPLAY STAND
Kenneth E. Johnson, Sr., Waco, Tex., assignor to T-Shirts Plus, Inc., Waco, Tex.
Filed Sep. 14, 1979, Ser. No. 75,726
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—152



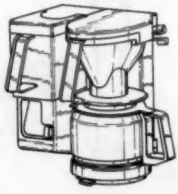
261,340
FURNITURE LEG AND RAIL CONNECTOR
Charles W. Clyburn, Reading, Ohio, assignor to James David Incorporated, Maryland Heights, Mo.
Filed Sep. 18, 1979, Ser. No. 76,789
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191

261,341
BASE FOR A TABLE OR THE LIKE
Gunter F. Eberle, Dallas, Tex., assignor to Vecta Contract, Inc., Grand Prairie, Tex.
Filed Jan. 24, 1979, Ser. No. 6,100
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

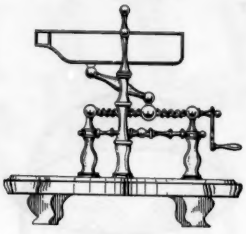
261,342
TABLE BASE
Stephen K. Frye, Fort Lauderdale, Fla., assignor to Lion in Frost Inc., Ft. Lauderdale, Fla.
Filed Feb. 26, 1979, Ser. No. 14,880
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

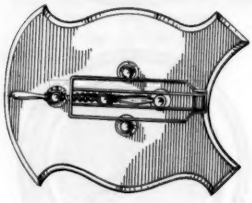
261,343
BASKET INSERT FOR A KITCHEN MACHINE
Oswald Gibiec, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Elektrowerke KG, Wuppertal, Fed. Rep. of Germany
Filed Mar. 27, 1979, Ser. No. 24,312
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 14145
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47

261,344
WALL-HUNG COFFEE MACHINE
Rudolf Maass, Solingen-Widdert, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Sep. 13, 1979, Ser. No. 74,997
Claims priority, application Fed. Rep. of Germany, May 5, 1979, 5MR8981
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62



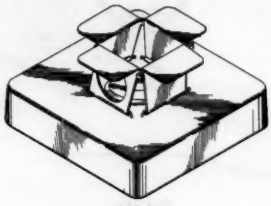
261,345
DECANTING CRADLE
Fritz Koeppel, 39 Tappan St., Everett, Mass. 02149, and Jean-Yves Loizance, 131 Commonwealth Ave., Boston, Mass. 02116
Filed Sep. 7, 1979, Ser. No. 73,278
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—70



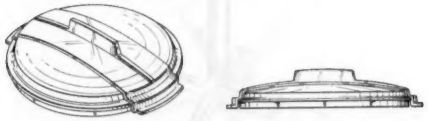


261,346
CUP CAKE STAMPER
Marjorie A. Thornley, c/o McCaleb, Lucas & Brugman, 230 W. Monroe St., Room 2040, Chicago, Ill. 60606
Filed Dec. 26, 1979, Ser. No. 106,384
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—101

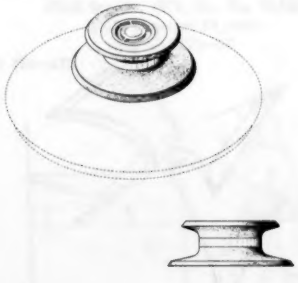
261,347
POT STAND ASSEMBLY FOR A PORTABLE CAMP STOVE
William R. Lütz, Chamblee, Ga., assignor to Conceptual Factors, Inc., Atlanta, Ga.
Filed May 31, 1979, Ser. No. 44,201
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—130



261,348
RIBBED COFFEE URN LID
Leo A. Groh; Douglas D. Ludwig, both of West Bend, Wis.; David L. Painter, Glenview, Ill., and John H. Free, Kalispell, Mont., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 4, 1980, Ser. No. 118,124
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—131



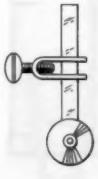
261,349
POT COVER HANDLE
Theophil Ryser, Beckenried, Switzerland, assignor to AMC International Alfa Metalcraft Corporation AG, Rotkreuz, Switzerland
Filed Aug. 1, 1979, Ser. No. 62,866
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—132



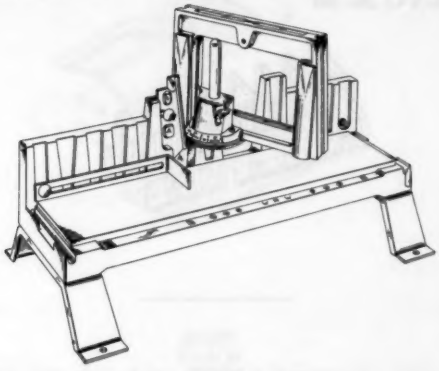
261,350
CLOTHES DRYER RACK
Taro Koshiyama, 46, 2-chome, Minamikinomoto, Yao-shi, Osaka-fu, Japan
Filed Oct. 24, 1978, Ser. No. 954,219
Claims priority, application Japan, Aug. 25, 1978, 53-16577
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—58

261,351
SNOW SCOOP BODY
William B. Carper, Harvard, Ill., assignor to Suntrak Industries, Inc., Harvard, Ill.
Filed Oct. 18, 1978, Ser. No. 952,574
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—10

261,352
GUIDE WHEEL FOR WELDING TORCHES
Louis E. Miller, 409 E. 13th St., Odessa, Tex. 79761
Filed Aug. 28, 1979, Ser. No. 70,448
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

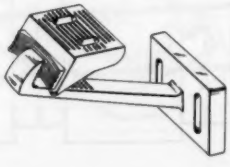


261,353
MITRE BOX
E. Curtis Ambler, Newington, and Sylvester W. Bies, Bloomfield, both of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed May 29, 1979, Ser. No. 42,864
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

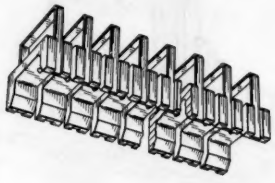


261,354
CARD EJECTOR HANDLE FOR A PRINTED CIRCUIT BOARD OR SIMILAR ARTICLE
Donald L. Clemens, The Colony, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.
Filed Feb. 11, 1980, Ser. No. 120,578
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—306

261,355
CATCH ASSEMBLY FOR DRAWERS AND CUPBOARDS
Alf Sundberg, Box 428, Sollentuna, Sweden
Filed May 17, 1979, Ser. No. 39,787
Claims priority, application Sweden, Nov. 17, 1978, 782667
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331

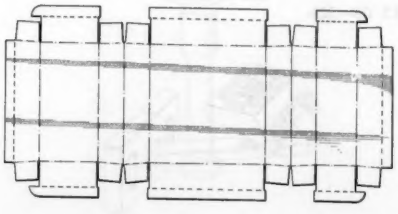


261,356
STRIP OF INSULATED CABLE CLIPS
Douglas Robinson, Preston, England, assignor to Ofrex Group Limited, London, England
Filed Mar. 3, 1978, Ser. No. 883,329
Claims priority, application United Kingdom, Sep. 7, 1977, 981432/77
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382

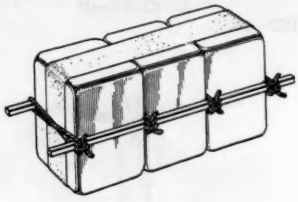


261,357
INSULATION INJECTION HOLE PLUG
R. Dean Doonan, 1001 Sunnyside Dr., Montezuma, Iowa 50171
Filed Jul. 28, 1978, Ser. No. 929,210
The portion of the term of this patent subsequent to Feb. 6, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D8—*99*; D9—*07*
U.S. Cl. D8—499

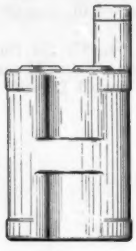
261,358
BLANK FOR THREE COMPARTMENT BOX
Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.
Filed Jun. 4, 1979, Ser. No. 31,328
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—346



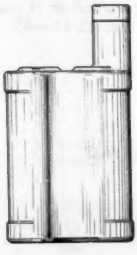
261,359
PACKAGE OF BLOCK-SHAPED ARTICLES
Henry E. Nass, 137 N. 4th St., Philadelphia, Pa. 19106
Filed Apr. 17, 1978, Ser. No. 896,782
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—337



261,360
CONTAINER FOR LIQUIDS OR THE LIKE
Charles N. Epperson, Okmulgee, Okla., assignor to Invention Development Equity Assoc., Inc., Okmulgee, Okla.
Filed Aug. 10, 1979, Ser. No. 65,597
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375

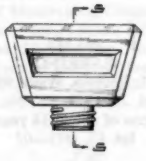


261,361
CONTAINER FOR LIQUID PRODUCTS OR THE LIKE
Charles N. Epperson, Okmulgee, Okla., assignor to Invention Development Equity Assoc., Inc., Okmulgee, Okla.
Filed Aug. 10, 1979, Ser. No. 65,598
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375

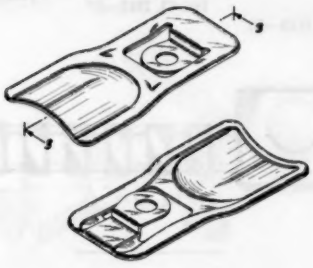


261,362
STACKABLE CONTAINER FOR LIQUIDS OR THE LIKE
Charles N. Epperson, Okmulgee, Okla., assignor to Invention Development Equity Assoc., Inc., Okmulgee, Okla.
Filed Aug. 10, 1979, Ser. No. 65,596
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376

261,363
BOTTLE
Joseph Sandor, Reseda, Calif., assignor to California Sounds Ltd., Tarzana, Calif.
Filed Apr. 30, 1979, Ser. No. 34,770
Term of patent 14 years
Int. Cl. D09—*01*
U.S. Cl. D9—413

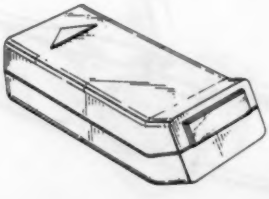


261,364
TAB FOR EASY OPENING CAN END
George F. Smyth, Los Angeles, Calif., assignor to Ermal C. Fraze, Dayton, Ohio
Filed Mar. 2, 1979, Ser. No. 17,157
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—438



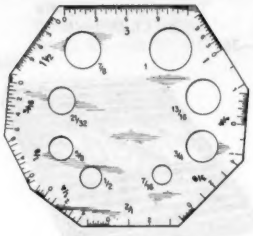
261,365
WATCH
Alain Carre, Paris, France, assignor to Waterman S.A., Paris, France
Continuation-in-part of Ser. No. 948,655, Oct. 3, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,275
Claims priority, application France, Apr. 7, 1979, 76 482
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

261,366
MICROWAVE DETECTOR
Yanta H. T. Lam, Kowloon, Hong Kong, assignor to Meyer Aluminium Limited, Kowloon, Hong Kong
Filed Jun. 25, 1979, Ser. No. 51,496
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—47

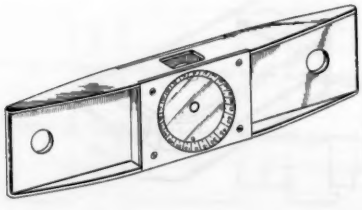


261,367
FRONT COVER FOR THERMOSTAT REGULATOR HOUSING
Mats Janson, Port, Switzerland, assignor to Tylo Sauna S.A., Biel-Bienne, Switzerland
Filed Apr. 6, 1979, Ser. No. 27,897
Claims priority, application Sweden, Oct. 16, 1978, 2389
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60

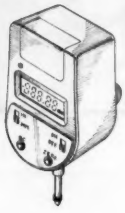
261,368
DRAWING INSTRUMENT
Joseph E. Barreca, Old Bridge Township, Mercer County, N.J., assignor to McGraw-Hill, Inc., New York, N.Y.
Filed Dec. 3, 1979, Ser. No. 99,562
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



261,369
COMBINED TORPEDO LEVEL AND PERIPHERAL ANGLE MEASURING DEVICE
James L. Smith, 17139 River Rd., Channelview, Tex. 77530
Filed Dec. 7, 1979, Ser. No. 102,109
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69



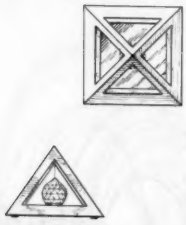
261,370
DIAL GAUGE
Yoshikazu Kikuchi, Tochigi, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1979, Ser. No. 92,065
Claims priority, application Japan, Jun. 22, 1979, 54-26354
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



261,371
BURGLAR ALARM HOUSING
Kenneth T. Lewis, 300 N. Sixth, Longview, Tex. 75601
Filed Feb. 5, 1979, Ser. No. 9,437
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

261,372
EARRING
Leo A. Fried, Box 371, Poulsbo, Wash. 98370
Filed Jul. 23, 1979, Ser. No. 59,611
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—40

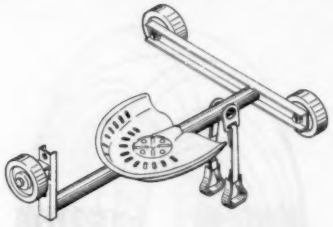
261,373
LIGHT-REFLECTING SCULPTURE
Stanley C. Fisher, 2434 Tocayo #158, San Diego, Calif. 92154
Filed Mar. 31, 1980, Ser. No. 135,263
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131



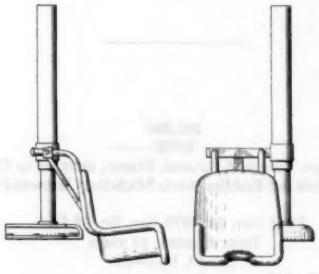
261,374
FIGURINE OF A DOLPHIN
Jesus A. Santa-Eulalia Carvajales, and Javier B. Santa-Eulalia Carvajales, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jun. 22, 1978, Ser. No. 918,319
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

261,375
FIGURINE OF A OKAPI
Jesus A. Santa-Eulalia Carvajales, and Javier B. Santa-Eulalia Carvajales, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jun. 22, 1978, Ser. No. 918,320
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

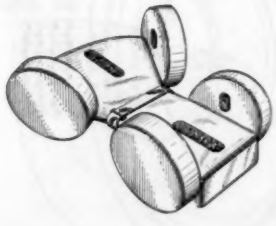
261,376
CONSTRUCTION TROLLEY
James A. Tipton, 1243 Browns Ferry Rd., Chattanooga, Tenn. 37419
Filed Jul. 2, 1979, Ser. No. 53,746
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—1



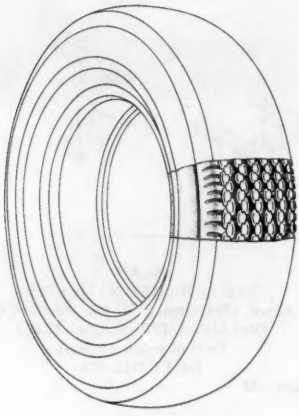
261,377
TUB MOUNTED BATH LIFT
Benton H. Grant, 126 Chestnut Hill Rd., Stamford, Conn. 06903
Filed May 3, 1979, Ser. No. 35,621
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—33



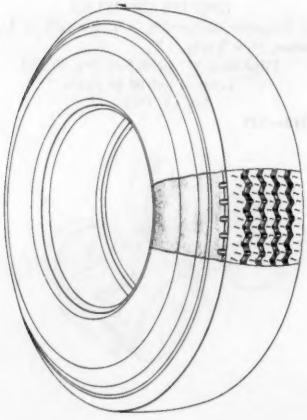
261,378
CHILD'S CRAWLER
Timothy J. Bergeron, Dolgeville, N.Y., assignor to J. A. Preston Corporation, New York, N.Y.
Filed Jun. 11, 1979, Ser. No. 47,383
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—128



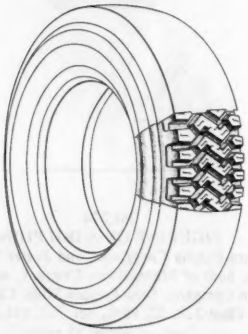
261,379
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Sep. 7, 1979, Ser. No. 73,267
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



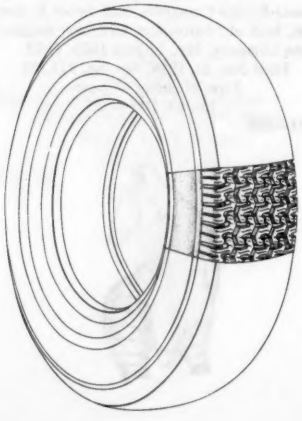
261,380
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Nov. 29, 1979, Ser. No. 98,558
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



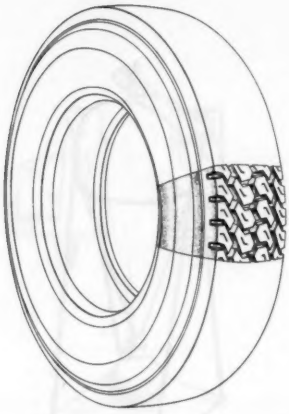
261,381
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Oct. 25, 1979, Ser. No. 88,121
Claims priority, application France, Apr. 27, 1979, 599
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



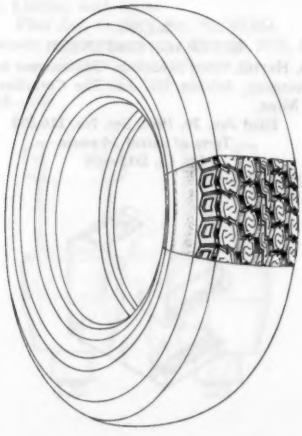
261,382
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Sep. 7, 1979, Ser. No. 73,268
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



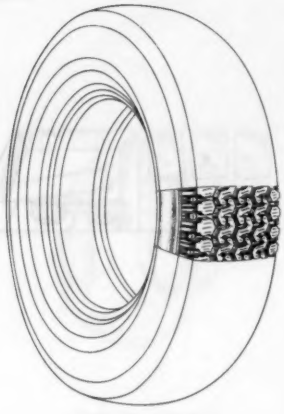
261,383
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Nov. 29, 1979, Ser. No. 98,557
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



261,384
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 10, 1980, Ser. No. 110,922
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

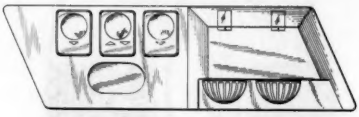


261,385
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 24, 1980, Ser. No. 114,822
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

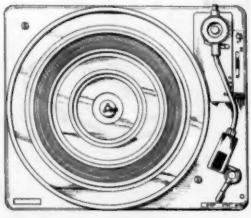


261,386
MOTORCYCLE TOTE BOX
Thomas S. Beaubien, Rancho Palos Verdes; Dennis C. Rich, Long Beach, and Robert E. Oehring, Norwalk, all of Calif., assignors to Bates Industries, Inc., Long Beach, Calif.
Filed Sep. 17, 1979, Ser. No. 77,164
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—158

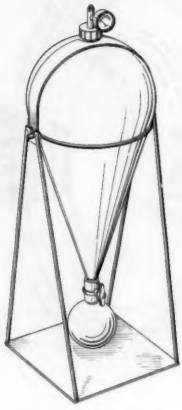
261,387
CONTROL PANEL FOR AIRCRAFT OR THE LIKE
Harry Weitz, New Hyde Park, and Diego M. Cacciatore, Farmingdale, both of N.Y., assignors to Instrument Systems Corporation, Jericho, N.Y.
Filed Apr. 20, 1979, Ser. No. 31,805
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—192



261,388
RECORD TURNTABLE
Raymond Vachus, Yzeure, France, assignor to Thomson-Brandt, Paris, France
Filed Jun. 4, 1979, Ser. No. 44,890
Claims priority, application France. Feb. 5, 1979, 77 277
The portion of the term of this patent subsequent to Sep. 15, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—25



261,389
FERMENTATION AND BEVERAGE STORAGE APPARATUS
Donald P. Pilla, 648 Cedar Ave., Burlington, Canada (L7T 2R5)
Filed Dec. 19, 1978, Ser. No. 971,067
Claims priority, application Canada, Oct. 31, 1978, 3110784
Term of patent 14 years
Int. Cl. D15—*08*; D23—*01*
U.S. Cl. D15—112

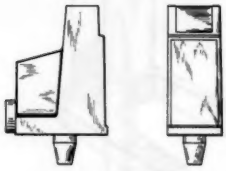


261,390
BEVERAGE DISPENSER
William A. Harvill, Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga. and The Cornelius Company, Anoka, Minn.
Filed Jan. 29, 1980, Ser. No. 116,503
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—116

261,391
BEVERAGE DISPENSER VALVE

Walter E. Ranua, Blaine, and William B. Mackrell, New Brighton, both of Minn., assignors to The Cornelius Company, Anoka, Minn.

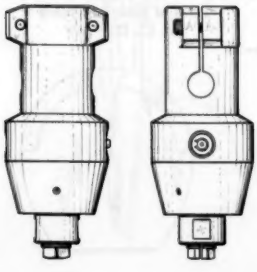
Filed Feb. 8, 1980, Ser. No. 119,735
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—120



261,392
SPINDLECASE ATTACHMENT FOR TAPPING MACHINES TO CHANGE THE ROTATION OF THE TOOL

Eiji Miyakawa, Tokyo, Japan, assignor to Miyakawa Industry Company, Limited, Seki, Japan

Filed Jun. 12, 1979, Ser. No. 47,856
Claims priority, application Japan, Dec. 15, 1978, 53-53014
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140



261,393
MOVIE CAMERA

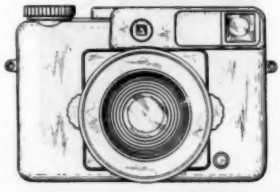
Norbert Schlagheck, Fuerstenfeldbruck, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 28, 1979, Ser. No. 15,781
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 15578
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—4

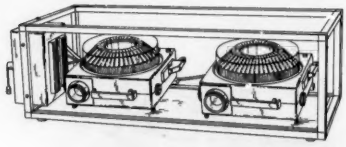
261,394
CAMERA

Udo M. Geissler, Munich, Fed. Rep. of Germany, assignor to Plaubel, Feinmechanik & Optik GmbH, Frankfurt am Main-Bergen-Enkheim, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 913,497
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 738671
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06

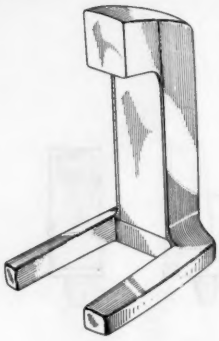


261,395
TARGET SLIDE PROJECTORS CONSOLE
Brain T. Brooksby, 156 Earlsbrook Rd., Redhill, Surrey; Harold J. Murray, 32 New Odiham Rd., Alton, Hampshire; Anthony Simpson, 65 South Hill, Godalming, Surrey, and Stuart M. Peterkin, 30 Leewood Way, Effingham, Surrey, all of England
Filed Feb. 21, 1979, Ser. No. 13,262
Claims priority, application United Kingdom, Aug. 24, 1978, 986059/78
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—11



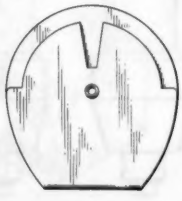
261,396
PHOTOGRAPHIC PRINT WASHER
Roger Wilken, R.F.D. 2-Bonnyvale Rd., Guilford, Vt. 05301
Filed Apr. 30, 1979, Ser. No. 34,837
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—35

261,397
MICROSCOPE STAND OR SIMILAR ARTICLE
Edwin A. Speaker, Brockport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 30, 1979, Ser. No. 34,223
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—131



261,398
DESK TOP ELECTRONIC CALCULATOR
Takashi Hirata, and Hideo Fushimoto, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 8, 1979, Ser. No. 64,904
Claims priority, application Japan, Feb. 23, 1979, 54-6649
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

261,399
BLACK JACK SLIDE RULE
Robert G. Wagner, 1077 Wakefield Ave., St. Paul, Minn. 55106
Filed Oct. 15, 1979, Ser. No. 84,939
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D18—10



261,400

COMBINED ADHESIVE CONTAINER AND DISPENSER

Glenn L. Beall, Gurnee, Ill.; Lawrence Petersen, Mount Vernon, N.Y., and Richard J. Dauksys, Glastonbury, Conn., assignors to Loctite Puerto Rico, Sabana Grande, P.R.

Continuation of Ser. No. 921,620, Jul. 3, 1978, abandoned. This application Jan. 28, 1980, Ser. No. 116,350

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—66

261,401

SIGN POST SUPPORT

Carroll E. Collis, 5640 Shull Street, Bell Gardens, Calif. 90201

Filed Dec. 7, 1979, Ser. No. 83,589

Term of patent 14 years

Int. Cl. D20—*03*

U.S. Cl. D20—41

261,402

BASKETBALL GAME DISPLAY AND CONTROL PANEL OR SIMILAR ARTICLE

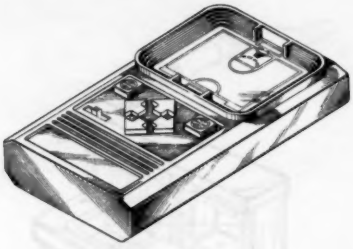
Robert B. Lovejoy, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 16, 1978, Ser. No. 951,903

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D21—13



261,403

TOY HOOP ROLLER

Joseph Pataki, 112 Graham Rd., Ithaca, N.Y. 14850

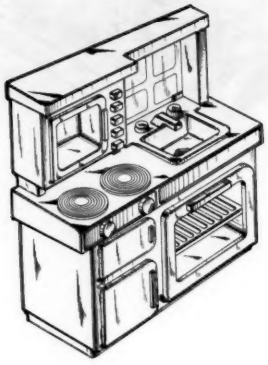
Filed Jun. 21, 1978, Ser. No. 917,688

Term of patent 14 years

Int. Cl. D21—*02*

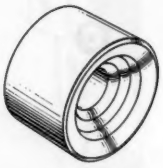
U.S. Cl. D21—101

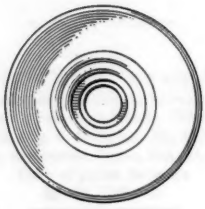
261,404
TOY KITCHEN
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Jan. 16, 1980, Ser. No. 112,718
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122



261,405
TOY RABBIT
Karen D. Marconi, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 15, 1980, Ser. No. 112,359
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—187

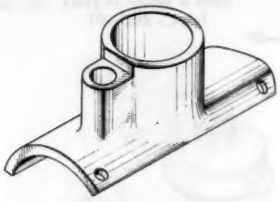
261,406
SKATE WHEEL
Gary L. Corbin, 11117 Klingerman St., El Monte, Calif. 91733
Filed Jul. 11, 1979, Ser. No. 56,546
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226





261,407
SHELTER
Charles W. Moss, c/o Moss Tent Works, Mt. Battle St., Camden, Me. 04843
Filed Jun. 1, 1979, Ser. No. 44,592
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—253

261,408
GAFF HOLDER FOR THE SPUR OF A GAMECOCK
John W. Bryan, 3501 Washington Dr., Falls Church, Va. 22042
Filed Mar. 14, 1980, Ser. No. 130,538
Term of patent 14 years
Int. Cl. D22—*02;* D30—*99*
U.S. Cl. D22—1



261,409
LONG BARREL HOLSTER
John E. Bianchi, 1601 Wilt Rd., and Richard D. E. Nichols, 813 Cozy Ct., both of Fallbrook, Calif. 92390
Filed Dec. 7, 1979, Ser. No. 101,200
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

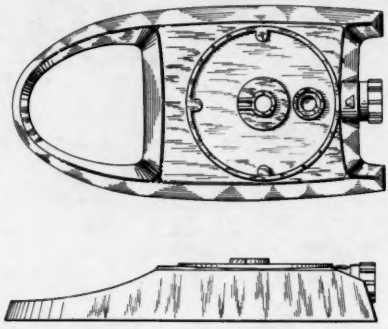
261,410
FISHING LURE
Dewey C. Mullins, Virginia Beach, Va., assignor to Mullins Lure Company, Virginia Beach, Va.
Filed Dec. 10, 1979, Ser. No. 101,670
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—29

261,411
FISHING ROD GRIP
Tetsuyuki Doi, and Takeshi Shohoji, both of Fukuyama, Japan, assignors to Ryobi Limited, Hiroshima, Japan
Filed Feb. 4, 1980, Ser. No. 118,236
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

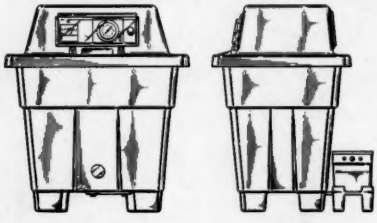
261,412
LINE GUIDE FOR FISHING ROD
Ryuichi Ohmura, Shizuoka, Japan
Filed Oct. 10, 1979, Ser. No. 83,521
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24

261,413
VACUUM FILTER
Roy T. Eddleman, 60916 Terminal Annex, Los Angeles, Calif. 90054
Filed Oct. 1, 1979, Ser. No. 80,437
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

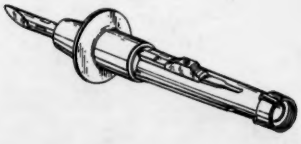
261,414
SPRINKLER BASE
Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed Mar. 8, 1979, Ser. No. 18,757
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



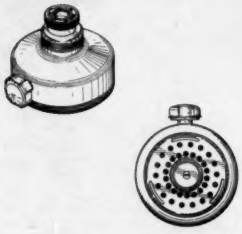
261,415
CHLORINE GENERATOR
Dow Yates, 2950 S. Shaver C-22, Pasadena, Tex. 77502
Filed Mar. 12, 1979, Ser. No. 19,850
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



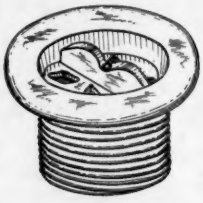
261,416
CAN PIERCING SPRAYING TOOL
Larry O. Siefken, R.R. 1, Box 75, Palmer, Iowa 50571
Filed Aug. 2, 1978, Ser. No. 930,583
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34



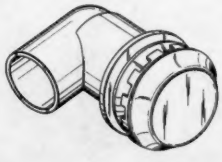
261,417
SHOWERHEAD
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed Aug. 27, 1979, Ser. No. 70,171
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, MR6936
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



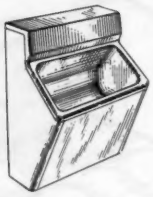
261,418
COMBINED STRAINER AND PLUG FOR A SINK OR THE LIKE
Edward Jackson, 26 McGahan St., Carina, Queensland, 4152, Australia
Filed Jun. 7, 1979, Ser. No. 46,546
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42



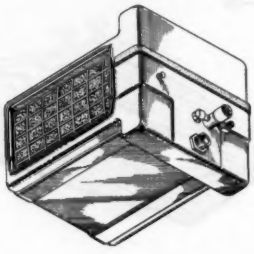
261,419
SAFETY SUCTION FITTING FOR HYDRO-THERAPY SPAS
Gerald W. Moreland, 11651 Pickett La., Garden Grove, Calif. 92640
Filed Nov. 5, 1979, Ser. No. 91,478
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42



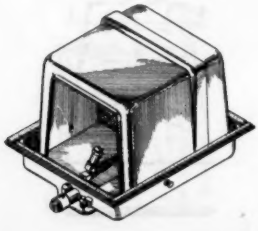
261,420
COMBINED PLUMBING FIXTURE BOWL AND CABINET
Lawrence E. Wolske, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 30, 1977, Ser. No. 866,174
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—59



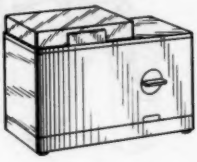
261,421
HUMIDIFIER FOR A HOT AIR FURNACE OR THE LIKE
William B. Morrow, Hillsville, Va., assignor to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed Aug. 24, 1979, Ser. No. 70,518
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147



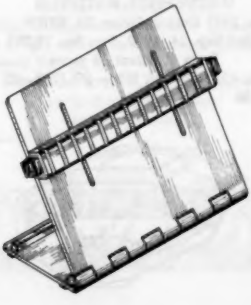
261,422
HUMIDIFIER FOR A HOT AIR FURNACE OR THE LIKE
William B. Morrow, Hillsville, Va., assignor to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed Aug. 24, 1979, Ser. No. 70,519
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147



261,423
DENTURE CLEANER OR THE LIKE
Hans-Jürgen Geissler, Frankfurt, Fed. Rep. of Germany, assignor to Rowenta-Werke, GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Oct. 4, 1979, Ser. No. 81,945
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, MR 10180
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D24—10

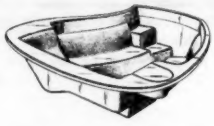


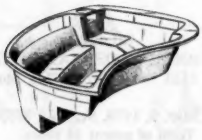
261,424
RACK FOR HOLDING DENTAL INSTRUMENTS
Robert A. Anson, 1423 Stony Brook Rd., Stony Brook, N.Y. 11790
Filed Mar. 9, 1978, Ser. No. 885,100
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—16



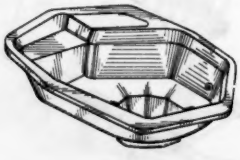
261,425
BONE CEMENT INJECTOR HANDPIECE
John A. Bruhn, New Paris, Ind., assignor to Zimmer USA, Inc., Warsaw, Ind.
Filed Feb. 11, 1980, Ser. No. 120,407
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

261,426
HYDROTHERAPY SPA
Richard G. Reineman, Newport Beach, Calif., assignor to Marlin Fiberglass, Inc., Huntington Beach, Calif.
Filed Aug. 27, 1979, Ser. No. 69,802
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02*
U.S. Cl. D24—38



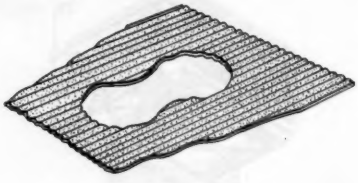


261,427
WHIRLPOOL BATHTUB
Philip I. Ogden, 1051 Boeing, Boise, Id. 83705
Filed Sep. 24, 1979, Ser. No. 78,097
Term of patent 14 years
Int. Cl. D24—*01;* D25—*99;* D23—*02*
U.S. Cl. D24—38

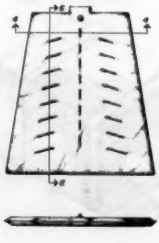


261,428
CHIROPRACTIC VIBRATOR
Edward D. Noble, 29 Havenbrook Blvd., Willowdale, Ontario, Canada (M2J 1A3)
Filed Nov. 20, 1978, Ser. No. 962,451
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—41

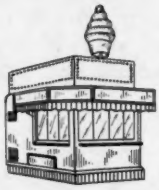
261,429
BED PAN SEAT LINER
Joan Hanna-Burns, 3630 S. Sepulveda 1-239, Los Angeles, Calif. 90034
Filed Aug. 31, 1979, Ser. No. 71,697
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



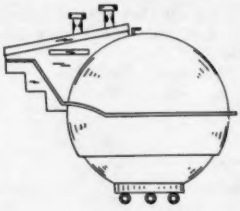
261,430
VACUUM SPLINT
Peter Baturin, Winnipeg, Canada, assignor to Medical Products Institute Incorporated, Winnipeg, Canada
Filed Oct. 10, 1978, Ser. No. 949,904
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



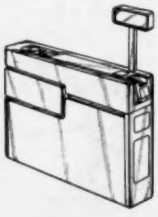
261,431
VENDING TRAILER
Shirley Barton, P.O. Box 2065, Sarasota, Fla. 33578
Filed Jan. 26, 1979, Ser. No. 6,631
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—10



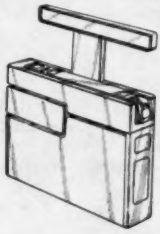
261,432
EMERGENCY SHELTER FOR UNDERGROUND INSTALLATION
James H. Ballard, 513 Bexar Ave., Hamilton, Ala. 35570
Filed Mar. 13, 1980, Ser. No. 130,076
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—36



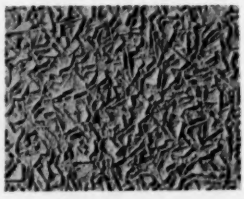
261,433
AUTOMATIC TICKET GATE
Yoshihiko Sugano, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jan. 4, 1980, Ser. No. 109,517
Claims priority, application Japan, Jul. 13, 1979, 54-28925
Term of patent 14 years
Int. Cl. D25—*02;* D20—*01*
U.S. Cl. D25—50



261,434
AUTOMATIC TICKET GATE
Yoshihiko Sugano, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jan. 4, 1980, Ser. No. 109,518
Claims priority, application Japan, Jul. 13, 1979, 54-28924
Term of patent 14 years
Int. Cl. D20—*01;* D25—*02*
U.S. Cl. D25—50

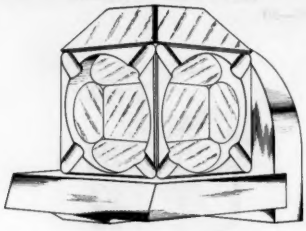


261,435
ACOUSTICAL CEILING PANEL
Mark R. Weitzman, Toledo, Ohio; Jared R. Kies, Perrysburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Sep. 27, 1979, Ser. No. 79,396
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—97



261,436
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Co., Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 35,995
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—80

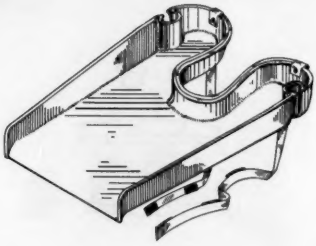
261,437
DECORATIVE WALL LAMP
Terry C. Stekelberg, R.R. #1, Pardeeville, Wis. 53954
Filed Nov. 27, 1978, Ser. No. 963,846
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—87



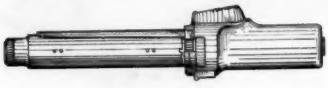
261,438
PIPE
S. Franklin Sher, 609 Lochmoor, Danville, Calif. 94526
Filed Jun. 2, 1980, Ser. No. 156,318
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

261,439
PIPE
S. Franklin Sher, 609 Lochmoor, Danville, Calif. 94526
Filed Jun. 2, 1980, Ser. No. 156,319
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

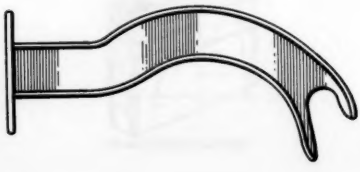
261,440
SHAMPOO DRAINAGE TRAY
Edward J. Pasquarello, 5 Silvermine Rd., Woburn, Mass. 01801
Filed Feb. 5, 1979, Ser. No. 9,111
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—20



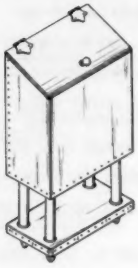
261,441
CURLING IRON
Robert Oberheim, Liederbach; Jürgen Greubel, Heidenrod, and Dieter Rams, Kronberg, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Jun. 19, 1980, Ser. No. 158,840
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 73 MR 8842
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



261,442
OROPHARYNGEAL AIRWAY
Charles C. Anderson, 2827 W. Meadowwood Dr., Chesapeake, Va. 23321
Filed Apr. 17, 1979, Ser. No. 30,826
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D29—6



261,443
WALL-MOUNTED MAILBOX
William DeLange, 5826 Foxboro Trail, Springfield, Mo. 65804
Filed Jun. 4, 1979, Ser. No. 44,958
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—33



261,444
BAKERY TRAY
Emil L. Munch, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio
Filed Nov. 30, 1978, Ser. No. 965,154
Term of patent 14 years
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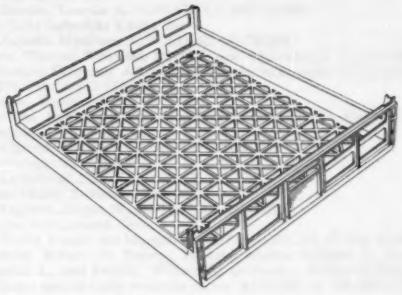

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF OCTOBER, 1981

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Antos, George J., to UOP Inc. Hydrocarbon dehydrocyclization with an attenuated superactive multimetallic catalytic composite. 4,295,960, Cl. 208-139.000.
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Kaspers, Helmut; and Brandes, Wilhelm, 4,296,116, Cl. 424-272.000.
Pedain, Josef; Uerdingen, Walter; and Muller, Hans-Jurgen, 4,296,230, Cl. 528-67.000.
Schmidt, Karl-Julius; Schmidt, Friedrich; Siegle, Peter; and Hansen, Gert, 4,296,047, Cl. 260-974.000.
Schroeder, Josef, 4,296,043, Cl. 260-352.000.
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.
Walz, Klaus; and Fiegel, Joachim, 4,295,852, Cl. 8-560.000.

BBC Brown, Boveri & Company Limited: *See—*
Floessel, Carl D., 4,296,271, Cl. 174-28.000.
Lang, Ernst; and Niemeyer, Lutz, 4,296,285, Cl. 200-61.080.
Mastner, Jiri, 4,296,412, Cl. 340-870.190.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research & Engineering Co. Catalysts hydrocarbon treating processes. 4,295,995, Cl. 252-431.00C.

Bearden, Roby, Jr.; Aldridge, Clyde L.; and Pine, Lloyd A., to Exxon Research & Engineering Co. Catalysts for hydrocarbon treating processes. 4,295,996, Cl. 252-431.00C.

Beasley, Denny D., to Beasley Electric Corporation. Motor having electronically switched stator field current and integral torque control. 4,296,362, Cl. 318-138.000.

Beasley Electric Corporation: *See—*
Beasley, Denny D., 4,296,362, Cl. 318-138.000.

Beatrice Foods Company: *See—*
Ziccarelli, Salvatore F.; Ramos, Rey C.; and Brown, Robert M., 4,296,136, Cl. 426-533.000.

Beattie, Ralph G.: *See—*
Seeburger, Harold O.; Beattie, Ralph G.; and Stevens, Violete L., 4,296,220, Cl. 525-507.000.

Beattie, Thomas R.; Christensen, Burton G.; and Dininno, Frank P., to Merck & Co. Inc. 7-Substituted methyl cephalosporins derivatives and analogues thereof. 4,296,111, Cl. 424-246.000.

Beaver, Bryan: *See—*
Fitzgerald, Stella; and Beaver, Bryan, 4,295,292, Cl. 46-201.000.

Beaver, Terry R.: *See—*
Kerle, Edward J.; and Beaver, Terry R., 4,296,009, Cl. 260-28.50R.

Beck, Gerhard: *See—*
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Beck, Richard A.; and Presley, Glen T., to Parno Corporation. Auxiliary drive system. 4,295,539, Cl. 180-243.000.

Becker Friedbert; Steinkamp, Johann; and Koenen, Klaus, to Siemens Aktiengesellschaft. Installation for control of a traffic light system by vehicles having an automatic location determination. 4,296,400, Cl. 340-32.000.

Becker, James; and Neill, Daniel L., to Kelsey Hayes Company. Electric brake system. 4,295,687, Cl. 303-20.000.

Becker, Paul D.: *See—*
Rudolph, Paul; and Becker, Paul D., 4,295,864, Cl. 55-40.000.

Becker, Reinhold; Michel, Wolfgang; and Hartmann, Gerhard, to Hoechst Aktiengesellschaft. Packaging sheath with contents. 4,295,563, Cl. 206-205.000.

Beckert, Alexander; and Knobbe, Karl-Heinz, to Reinhard Mohn GmbH. Method and apparatus for drying and setting the adhesive on books by vaporization of water using RF energy. 4,296,294, Cl. 219-10.410.

Beckman Instruments, Inc.: *See—*
Cowell, Mark J., 4,295,601, Cl. 233-26.000.

Becton, Dickinson and Company: *See—*
Christinger, Werner, 4 295,477, Cl. 128-766.000.
Percarpio, Edward P., 4,295,572, Cl. 215-247.000.
Quaas, Gary F., 4,295,476, Cl. 128-764.000.
Vincek, Robert C., 4,295,566, Cl. 206-457.000.

Beecham Group Limited: *See—*
Denerley, Paul M., 4,296,032, Cl. 260-245.20R.
Knudsen, Eric T., 4,295,567, Cl. 206-534.000.

Behr, R. Douglas: *See—*
Sutrina, Thomas A.; and Behr, R. Douglas, 4,295,919, Cl. 156-498.000.

Behringwerke Aktiengesellschaft: *See—*
Ax, Wolfgang; Bauer, Hartwig W.; and Sedlacek, Hans-Harald, 4,296,201, Cl. 435-7.000.

Beiersdorf Aktiengesellschaft: *See—*
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.

Beinitz, Karl; and Schubert, Joachim, to Leybold-Heraeus GmbH. Ionization vacuum gauge circuit. 4,296,356, Cl. 315-135.000.

Belanger, Andre: *See—*
Poirier, Marc; Gauthier, Michel; and Belanger, Andre, 4,295,939, Cl. 204-1.00T.

Bell, Clinton C., to Ward Machinery Company, The. Stripping device for removing waste sheet board. 4,295,842, Cl. 493-342.000.

Bell, Dwain C.; and Anderson, Lloyd E. Roll lifting dollies. 4,295,777, Cl. 414-458.000.

Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., to Colt Industries Operating Corp. Adaptive control of gap voltage and power to control servo operation of an electrical discharge machining apparatus. 4,296,302, Cl. 219-69.00G.

Bell, Robert L., to Besco Industries, Inc. Force responsive transducer. 4,295,376, Cl. 73-724.000.

Bell Telephone Laboratories, Incorporated: *See—*
Hafer, Edward H., 4,296,492, Cl. 370-14.000.
Henry, Paul S., 4,296,374, Cl. 324-77.00B.
O'Neil, Joseph T.; Quinn, Thomas M.; and Wang, Tse L., 4,296,282, Cl. 179-99.0LS.
Snyder, Dennis R., 4,295,702, Cl. 339-97.00P.
Stone, Dale E., 4,296,337, Cl. 307-356.000.
Wong, William H., 4,296,454, Cl. 361-380.000.

Bellaff, Leslie. Heat reclaimer. 4,295,519, Cl. 165-11.00R.

Bemis, Richard S.; and McCartan, Daniel A., to Owens-Corning Fiberglas Corporation. Fibrous glass blowing insulation and process. 4,296,164, Cl. 428-219.000.

Benedictine Monks Inc.: *See—*
Reedy, Charles B., 4,295,459, Cl. 126-60.000.

Beneke, Wolfgang; and Teichmann, Paul, to Trutzschler GmbH & Co. KG. Carding wire brush arrangement. 4,295,248, Cl. 19-113.000.

Bennett, Alan F.: *See—*
Clayton, Edward R. C.; and Bennett, Alan F., 4,295,605, Cl. 236-56.000.

Bennett, Robert W. Fluid-powered submersible sampling pump. 4,295,801, Cl. 417-397.000.

Benson, Henry E.; and Moravec, Terrence D., to UOP Inc. Apparatus for assembling a plastic mining screen. 4,295,918, Cl. 156-434.000.

Bentley, Arthur P. Sonic pressure wave surface operated pump. 4,295,799, Cl. 417-240.000.

Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., to

Weyerhaeuser Company. Treating pulp with oxygen. 4,295,925, Cl. 162-19.000.

Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., to Weyerhaeuser Company. Method and apparatus for treating pulp with oxygen. 4,295,926, Cl. 162-57.000.

Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., to Weyerhaeuser Company. Method and apparatus for treating pulp with oxygen and storing the treated pulp. 4,295,927, Cl. 162-57.000.

Bepple, Henry: *See*—
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,925, Cl. 162-19.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,926, Cl. 162-57.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,927, Cl. 162-57.000.

Berg, Gunner: *See*—
Hagberg, Gideon, 4,295,969, Cl. 210-223.000.

Berg, Ramon A.: *See*—
Bjorklund, Lowell L.; Berg, Ramon A.; and Sygnator, Henry A., 4,295,351, Cl. 72-38.000.

Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, to Boehringer Mannheim GmbH. Diagnostic composition for the detection of leukocytes and chromogens useful therein. 4,296,202, Cl. 435-29.000.

Berger, Eugene, to Solvay & Cie. Polymerization of olefins. 4,296,223, Cl. 526-125.000.

Berger, Mitchell H.: *See*—
Maresca, Louis M.; Gill, Peter J.; and Berger, Mitchell H., 4,296,232, Cl. 528-179.000.

Bergner, Dieter; Hannesen, Kurt; Muller, Wolfgang; and Schulte, Wilfried, to Hoechst Aktiengesellschaft. Process for the production of liquid chlorine. 4,295,945, Cl. 204-128.000.

Berlec, Ivan; and McCarty, Lewis V., to General Electric Company. Incandescent lamp. 4,296,352, Cl. 313-315.000.

Bernier, John A., to Fisher Scientific Company. High-voltage spark source. 4,296,358, Cl. 315-241.00R.

Berrebi, Claudine; and Manoussos, Georges, to L'Oreal. Process for extracting embryonic calf skin and pharmaceutical compositions containing the same. 4,296,099, Cl. 424-105.000.

Berry, Peter J., to Barr & Stroud Limited. Scanning mirror position system. 4,296,325, Cl. 250-347.000.

Besco Industries, Inc.: *See*—
Bell, Robert L., 4,295,376, Cl. 73-724.000.

Betsinger, James D.; and Bailey, James P. Shower apparatus. 4,295,612, Cl. 239-310.000.

Bey, Roger, to Babcock & Wilcox Company, The. Drag ball valve including variable pressure reducing means. 4,295,493, Cl. 138-43.000.

Beyer, Franz; and Sedlmair, Siegfried, to Siemens Aktiengesellschaft. P-I-N type diode high frequency switch for secondary radar interrogation devices and transponders. 4,296,414, Cl. 343-5.0SW.

Bezverkhny, Alexandr M.: *See*—
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.

Biela, John A., to Schiffman, Jerome D., deceased. Comb and the method of making same. 4,295,480, Cl. 132-151.000.

Bigalke, Erhard: *See*—
Zimmermann, Frank; Heidemeyer, Paulus; and Bigalke, Erhard, 4,295,551, Cl. 192-0.076.

Bill, Robert C.; and Ludwig, Lawrence P., to United States of America, National Aeronautics and Space Administration. Composite seal for turbomachinery. 4,295,786, Cl. 415-174.000.

Binggeli, Bruno K.: *See*—
Kiess, Helmut G.; and Binggeli, Bruno K., 4,296,478, Cl. 365-112.000.

Bingham, Robert M.: *See*—
LeBlanc, Ralph W.; and Bingham, Robert M., 4,295,966, Cl. 210-180.000.

Bishop, John F.; and Bowman, Wayne A., to Eastman Kodak Company. Two-sheet diffusion transfer assemblages and photographic elements. 4,296,195, Cl. 430-215.000.

Bixby, Guy T., to Gates Rubber Company, The. Hose with internal insert member. 4,295,496, Cl. 138-122.000.

Bjorklund, Lowell L.; Berg, Ramon A.; and Sygnator, Henry A., to Illinois Tool Works Inc. Self-tapping stainless steel screw and method for producing same. 4,295,351, Cl. 72-38.000.

Black, John W., to Pemco-Kalamazoo, Inc. Disk wheel with resilient bearing support and rigid annular tread mounting surface. 4,295,686, Cl. 301-63.0DD.

Blair, Russell M., to Slickbar, Inc. Floating boom end connectors. 4,295,756, Cl. 405-70.000.

Blake, Charles H.; and Wood, Donald H., to Outboard Marine Corporation. Speed selection for a direct current permanent magnet motor. 4,296,363, Cl. 318-349.000.

Blake, David E.: *See*—
Barth, Charles F.; Stelson, Thomas S.; and Blake, David E., 4,295,301, Cl. 51-165.880.

Blanding, Douglass L.: *See*—
Montalto, Michael S.; Blanding, Douglass L.; and Smith, Michael R., 4,296,070, Cl. 422-65.000.

Blanks, James A.: *See*—
Moore, W. Edward C.; and Blanks, James A., 4,295,613, Cl. 241-2.000.

Blasnik, William, to Hardware Designers, Inc. Bearing construction. 4,295,688, Cl. 308-3.800.

Blevins, Charles W.: *See*—
Whitaker, Roger B.; and Blevins, Charles W., 4,296,409, Cl. 340-684.000.

Blincow, Donald W.; Cassedy, Kevin H.; and Dominey, Samuel C., Jr., to Tyco Laboratories. Bit pressure gauge for well drilling. 4,296,321, Cl. 250-254.000.

Blodgett, Camille C. Children's sleeping garments. 4,295,230, Cl. 2-69.500.

Blodgett, Norman S.: *See*—
Nicholson, William H., 4,295,506, Cl. 144-193.00D.

Blount, David H. Process for the production of poly (polyisocyanate-polyol-alkali metal silicate) solid or foamed products. 4,296,211, Cl. 521-154.000.

Blue Circle Industries Limited: *See*—
Smith, David E., 4,295,933, Cl. 162-168.0NA.

Blutschkau, Heinke: *See*—
Mecke, Norbert; Schmitt, Franz U.; Schrader, Karl-Heinz; and Blutschkau, Heinke, 4,296,150, Cl. 427-164.000.

Boart International Limited: *See*—
Holmberg, John M., 4,295,751, Cl. 403-306.000.

Bocquet, Gilbert: *See*—
Droux, Michel; and Bocquet, Gilbert, 4,295,871, Cl. 65-3.410.

Bodart, Robert; and Werts, Jean P. A. R. J., to U.S. Philips Corporation. Method of and arrangement for regenerating start-stop signals. 4,296,493, Cl. 370-48.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Flavoring with 1-ethoxy-1-ethanol acetate. 4,296,137, Cl. 426-534.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Flavoring with 1-n-butoxy-1-ethanol acetate. 4,296,138, Cl. 426-534.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Huber, Bernhard, 4,295,854, Cl. 23-230.0PC.

Boehmke, Gunther, to Bayer Aktiengesellschaft. Fuels and heating oils, a process for their preparation and their use. 4,295,859, Cl. 44-51.000.

Boehringer Ingelheim GmbH: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.

Boehringer Mannheim: *See*—
Weiss, Erich; and Ungermann, Dieter, 4,296,071, Cl. 73-864.110.

Boehringer Mannheim GmbH: *See*—
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.

Boeing Company, The: *See*—
Adamski, John L., 4,296,327, Cl. 250-423.00R.

Boldt, Wayne A. Liquid egg blend. 4,296,134, Cl. 426-250.000.

Bolte, Steven B.: *See*—
Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.

Bommaraju, Tilak V.; Dexter, Theodore H.; and Rader, Charles G., to Hooker Chemicals & Plastics Corp. Film-coated cathodes for halate cells. 4,295,951, Cl. 204-242.000.

Bond, Ned J., III. Pneumatically operated grain handling apparatus. 4,295,614, Cl. 241-34.000.

Boogers, Wilhelmus P. L., to B.V. Arenco P.M.B. Method and device for manufacturing cigars. 4,295,479, Cl. 131-60.000.

Book, Harold M. Diaphragm and ball valve. 4,295,488, Cl. 137-414.000.

Boone, Jacob J.: *See*—
Terry, Robert R.; and Boone, Jacob J., 4,295,573, Cl. 215-348.000.

Bopst, John H., III. System for controlling the movement and locking of tape apparatus. 4,295,921, Cl. 156-577.000.

Borg-Warner Corporation: *See*—
McIntosh, Arthur M., 4,295,798, Cl. 417-212.000.

Borowitz, Raymond P. Side dispensing closure. 4,295,584, Cl. 222-519.000.

Borst, Gaylord M., to Outboard Marine Corporation. Inboard-outboard driving mechanism including a hydraulically assisted steering system. 4,295,833, Cl. 440-63.000.

Borsting, Otto W.: *See*—
Card, Lorin P.; and Borsting, Otto W., 4,295,630, Cl. 251-14.000.

Bortolussi, Everest J. Magnetic safety clutch for rotary lawnmower. 4,295,327, Cl. 56-11.300.

Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, to Alpha Farmaceutici S.p.A. Derivatives of benzoyl-phenoxyalkanoic acids having normolipemizing activity. 4,296,125, Cl. 424-315.000.

Bosca, Bernard: *See*—
Maurel, Pierre; Nicolas, Francois; and Bosca, Bernard, 4,296,073, Cl. 423-3.000.

Bosch, Erhard: *See*—
Innertsberger, Ernst; Sommer, Oswin; Bosch, Erhard; Muller, Johann; and Schiller, August, 4,296,228, Cl. 528-33.000.

Boswell, George T., to Frontier Industries, Inc. Toy projectile. 4,295,290, Cl. 46-74.00C.

Bott, John A. Article carrier for automotive vehicles. 4,295,587, Cl. 224-321.000.

Bottiglia, Augusto, to Sio-Societa per l'Industria Dell'Ossigenc e di Altri Gas. Method and device for welding protected metal parts. 4,296,300, Cl. 219-61.700.

Boucher, Pierre, to Etablissements Boucher Freres. Device for holding a workpiece to be machined in a specific position in relation to a machine-tool on which it may be fixed. 4,295.641, Cl. 269-136.000.

Boudreau, Archie E. Milking apparatus. 4,295,490, Cl. 137-595.000.

Boulanger, Henry J.; Lowell, Victor; and Whipple, Elliot, to Texas Instruments Incorporated. Weatherproofed condition responsive switch. 4,296,287, Cl. 200-83.00P.

Boultinghouse, Harold D., to Phillips Petroleum Company. Fluorinated polymeric surfaces. 4,296,151, Cl. 427-255.100.

Boussekey, Bernard: *See—*
Chielens, Alain; and Boussekey, Bernard, 4,295,825, Cl. 432-116.000.

Boussuges, Pierre, to Neyrpic. Starting of pumps or turbopumps. 4,295,782, Cl. 415-1.000.

Bouvet, Pierre; and Lalu, Jean-Pierre, to Produits Chimiques Ugine Kuhlmann. Polyfluorinated sulfonamides. 4,296,034, Cl. 260-326.820.

Bovone, Luigi. Apparatus for automatically producing glazed insulating window or door panels. 4,295,920, Cl. 156-557.000.

Bowden, Edgard A., to Mobil Oil Corporation. On-board analog reproducer unit for ocean-bottom seismometer. 4,296,442, Cl. 360-6.000.

Bowman, Arthur F.: *See—*
Smith, Don H.; Bowman, Arthur F.; and Junk, Norman M., 4,295,424, Cl. 102-322.000.

Bowman, Wayne A.: *See—*
Bishop, John F.; and Bowman, Wayne A., 4,296,195, Cl. 430-215.000.

Bowsky, Benjamin, to Emerson Electric Co. Hermetic refrigeration terminal. 4,296,275, Cl. 174-152.0GM.

Brady, Michael B. C.: *See—*
Esterson, Maurice; and Brady, Michael B. C., 4,296,385, Cl. 331-90.000.

Brand, Derek A.; and Brand, Derek R., to Tyco Industries, Inc. Pick-up shoe and motor contact assembly for toy vehicle. 4,295,295, Cl. 46-259.000.

Brand, Derek R.: *See—*
Brand, Derek A.; and Brand, Derek R., 4,295,295, Cl. 46-259.000.

Brandes, Wilhelm: *See—*
Kaspers, Helmut; and Brandes, Wilhelm, 4,296,116, Cl. 424-272.000.

Brandt, Howard C.; and Grabowski, Leonard R., to General Motors Corporation. Ball nut and screw assembly with travel limit stop. 4,295,384, Cl. 74-424.8NA.

Brandwijk, Willem; and Dam, Herman, to IHC Holland N.V. Support frame for motor, pump and suction tube of a suction dredger. 4,295,286, Cl. 37-58.000.

Braun, Erwin: *See—*
Schuler, Peter; and Braun, Erwin, 4,295,857, Cl. 23-301.000.

Braun, Franz: *See—*
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.

Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., to Hoechst Aktiengesellschaft. Vinyl polymer with acetylacetoxy groups, process for its manufacture and an agent obtained thereof. 4,296,226, Cl. 526-316.000.

Breen, John J., to Eastman Kodak Company. Camera mechanism employing a multifunction control member. 4,295,715, Cl. 354-25.000.

Brendel, Thomas E.: *See—*
Hannett, William J.; Brendel, Thomas E.; and Wilson, David S., 4,295,344, Cl. 62-324.500.

Breslin, Michael D., to Nalco Chemical Company. Phenolic compounds as viscosity preservatives during hypochlorite pulp bleaching. 4,295,928, Cl. 162-73.000.

Bretl, Wayne E.: *See—*
d'Hautecourt, Alain H.; Bretl, Wayne E.; and Lee, Ronald B., 4,296,435, Cl. 358-166.000.

Bricher, Charles W.; and Herpers, Ferdinand J., to Tennant Company. Scarifying machine. 4,295,274, Cl. 30-347.000.

Bridgestone Tire Company Limited: *See—*
Kawaguchi, Yasuyosi; Shimotake, Munetoshi; and Yamamoto, Fujio, 4,295,512, Cl. 152-354.00R.
Ohashi, Takashi; Okoyama, Toru; and Arai, Katsuhiko, 4,296,170, Cl. 428-313.000.
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.

Brink, Dirk Marinus: *See—*
Foxcroft, Garth, 4,295,510, Cl. 152-220.000.

Brinkerhoff, VerDon C. Regenative absorption engine apparatus and method. 4,295,335, Cl. 60-673.000.

Bristol, Robert G., to Emhart Industries, Inc. Capacitive scheme for measuring the level of a liquid. 4,295,370, Cl. 73-304.00C.

British Broadcasting Corporation: *See—*
Drewery, John O.; and Storey, Richard, 4,296,434, Cl. 358-105.000.

British Chrome & Chemicals Ltd.: *See—*
Swales, Danvers A.; and Marshall, Michael A., 4,296,076, Cl. 423-53.000.

Bronstert, Klaus: *See—*
Staiger, Gerhard; and Bronstert, Klaus, 4,296,222, Cl. 526-119.000.

Brookfield Athletic Shoe Company, Inc.: *See—*
Landay, David L.; and Wolf, Alvan H., 4,295,655, Cl. 280-11.200.

Brooklyn Union Gas Company: *See—*
McGowan, John B.; and Trimble, John, 4,295,494, Cl. 138-89.000.

Brown, Frank, Jr., to Sunroc Corporation. Wall mounted drinking fountain with push bar actuator. 4,295,609, Cl. 239-29.000.

Brown Group, Inc.: *See—*
Doerer, Daniel M.; and Brunkhorst, Lloyd E., 4,296,053, Cl. 264-26.000.

Brown, Robert M.: *See—*
Ziccarelli, Salvatore F.; Ramos, Rey C.; and Brown, Robert M., 4,296,136, Cl. 426-533.000.

Brown, Sheldon H.: *See—*
Garcia, Felix, Jr.; Hergert, Roger A.; Mann, Don C.; and Brown, Sheldon H., 4,296,448, Cl. 360-135.000.

Brown, Thomas R.: *See—*
Natzke, Ronald C.; and Brown, Thomas R., 4,295,287, Cl. 37-103.000.

Brown, William E.: *See—*
Weisenborn, Frank L.; Brown, William E.; and Meyers, Edward, 4,296,101, Cl. 424-119.000.

Browne, Leslie J., to Ciba-Geigy Corporation. Pyridylalkylamines. 4,296,115, Cl. 424-263.000.

Brunkhorst, Lloyd E.: *See—*
Doerer, Daniel M.; and Brunkhorst, Lloyd E., 4,296,053, Cl. 264-26.000.

Brunner, Herbert, to Nuken GmbH. Apparatus for conditioning bioinjurious waste. 4,295,745, Cl. 366-302.000.

Brunswick Corporation: *See—*
Mapes, Charles W.; and Snyder, Richard H., 4,295,835, Cl. 440-78.000.

Buchi, Georges H.: *See—*
Fehr, Charles; Ohloff, Gunther; and Buchi, Georges H., 4,296,258, Cl. 568-364.000.

Buchta, Ervin A., to FMC Corporation. Manual override control for double-acting actuator. 4,295,390, Cl. 74-625.000.

Buck, Gordon K.; and Kozin, Cynthia H., to Harris Corporation. Apparatus for diagnosing faults in individual cylinders in an internal combustion engine. 4,295,363, Cl. 73-117.300.

Buckingham, James W., to Owens-Illinois, Inc. Thermoplastic gob feeding and transfer method and apparatus. 4,296,061, Cl. 264-138.000.

Buckley, Alan J.; and Singer, Michael, to Imperial Chemical Industries Limited. Method for the control of micro-organisms. 4,295,887, Cl. 106-18.330.

Budd Company, The: *See—*
Dickhart, William W., III; and Marvin, Richard H., 4,295,428, Cl. 105-168.000.
Eggert, Walter S., Jr., 4,295,790, Cl. 416-226.000.

Bugaut, Andree: *See—*
Grollier, Jean F.; Bugaut, Andree; Andrillon, Patrick; and Fourcadier, Chantal, 4,295,848, Cl. 8-421.000.

Bugdahl, Volker; Morlock, Gerhard; Reidt, Werner; and Kerschner, Emil, to Degussa Aktiengesellschaft. Binder for coating compositions and its use. 4,296,006, Cl. 260-23.0EP.

Bulgakov, Evgeny G.: *See—*
Anisimov, Vyacheslav I.; Bulgakov, Evgeny G.; Gurin, Vasily N.; Radjukevich, Leonid V.; Trishevsky, Igor S.; Trishevsky, Oleg I.; Kheifets, Grigory R.; and Jurchenko, Anatoly B., 4,295,353, Cl. 72-180.000.

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Bunker Ramo Corporation: *See—*
Chow, Weichien, 4,295,698, Cl. 339-59.00R.

Bunning, Robin G.: *See—*
Payne, Alan; and Bunning, Robin G., 4,295,776, Cl. 414-405.000.

Burk, Emmett H., Jr.: *See—*
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Burke, Michael R. Tie-down structure. 4,295,765, Cl. 410-101.000.

Burnett, Roy E.: *See—*
Reeves, H. Neal; Burnett, Roy E.; Denham, Leslie R.; and Shields, George E., 4,295,542, Cl. 181-108.000.

Burnop, Victor C. Production of overbased magnesium detergent additives. 4,295,981, Cl. 252-33.400.

Burns, Carmen D., to National Semiconductor Corporation. Apparatus and process for laminating composite tape. 4,295,912, Cl. 156-324.000.

Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,295,861, Cl. 44-63.000.

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Nahar, Rathindra; and Dietze, Robert H., 4,295,645, Cl. 271-34.000.
Reid, Gilbert R., 4,296,456, Cl. 361-403.000.

Burstinghaus, Rainer; Kiehs, Karl; and Adolphi, Heinrich, to BASF Aktiengesellschaft. 2,2-Dichlorocyclopropyl-methyl-phosphoric acid derivatives. 4,296,108, Cl. 424-210.000.

Bursztejn, Jacques, to Thomson CSF. Device for measuring the quality of a digital radio link. 4,296,495, Cl. 371-22.000.

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Butler Manufacturing Co.: *See—*
Flachbarth, Charles T., 4,295,575, Cl. 220-3.920.

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B.V. Arenco P.M.B.: *See—*
Boogers, Wilhelmus P. L., 4,295,479, Cl. 131-60.000.

C.I.S.E. Centro Informazioni Studi Esperienze S.p.A.: *See*—
Mezzetti, Sergio; Pizzolati, Pierluigi; and Svelto, Francesco, 4,296,318, Cl. 250-225.000.
Cahen, David: *See*—
Hodes, Gary; Cahen, David; and Manassen, Joost, 4,296,188, Cl. 429-111.000.
Cain, Robert L., to Robinair Manufacturing Corporation. Selective mode multi-stage vacuum pump. 4,295,794, Cl. 417-62.000.
Cale, Albert D., Jr., to A. H. Robins Company, Incorporated. 4,5-Dihydro-3,3-diphenyl-4-hydrocarbylaminomethylfuran-2(3H) ones. 4,296,037, Cl. 260-343.600.
Calspan Corporation: *See*—
Pelton, Frank M.; Miller, Clyde A.; and Leney, Thomas F., 4,296,415, Cl. 343-16.00M.
Calvert, Rodney K., to Mead Corporation, The. Carton with carrying strap. 4,295,598, Cl. 229-52.0AL.
Camirand, Wayne M.; Randall, John M.; and Hautala, Earl, to United States of America, Agriculture. Melting icebergs to produce fresh water and mechanical energy. 4,295,333, Cl. 60-641.600.
Cammarata, Jacob J., to Medtronic, Inc. Electrode positioning system. 4,295,270, Cl. 29-828.000.
Campbell, Charles A.: *See*—
Wynosky, Thomas A.; and Campbell, Charles A., 4,295,611, Cl. 239-265.370.
Campbell, Christopher J.: *See*—
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.
Campbell, Crom B. Producer gas fueled burner system and drying apparatus. 4,295,822, Cl. 432-29.000.
Campbell, Henry F., to Campbell Research Corporation. Building construction. 4,295,312, Cl. 52-408.000.
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Canadian Patents & Dev. Ltd.: *See*—
Moore, William J. M.; Kusters, Norbert L.; and So, Eddy, 4,296,369, Cl. 323-218.000.
Cannavan, Christopher J. Sugar cane harvester. 4,295,325, Cl. 56-13.900.
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Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, 4,295,889, Cl. 106-22.000.
Hara, Toshitami; Sato, Yashushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,296,421, Cl. 346-140.00R.
Ishiwatari, Masumi, 4,295,712, Cl. 350-344.000.
Momiyama, Kikuo; and Kumazawa, Kenichi, 4,295,723, Cl. 354-155.000.
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,296,309, Cl. 219-216.000.
Takashi, Uchiyama; Tsunekawa, Tokuichi; and Kiyohara, Takehiko, 4,295,722, Cl. 354-146.000.
Canron Corp.: *See*—
Rhodes, Curtis A.; Jur, Tim A.; and Keating, Donald A., 4,295,259, Cl. 29-402.180.
Caplin, Peter B.; and Harman, Maurice, to Energy Equipment Co. Ltd., The. Method and means for controlling the operation of fluidized bed combustion apparatus. 4,295,817, Cl. 431-7.000.
Card, Lorin P.; and Borsting, Otto W., to Greer Hydraulics, Incorporated. Fail-safe actuator and hydraulic system incorporating the same. 4,295,630, Cl. 251-14.000.
Cardenas, Carlos G.; and Din, Zia U., to SCM Corporation. Process for producing dihydrocarvone geometric isomers. 4,296,257, Cl. 568-361.000.
Cardenas, Carlos G.: *See*—
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Cardiac Pacemakers, Inc.: *See*—
Bartelt, James T., 4,295,468, Cl. 128-419.0PT.
Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
Buzzi, Fabio; and Carniti, Sergio, 4,295,834, Cl. 440-76.000.
Carl Kurt Walther GmbH & Co. KG: *See*—
Walther, Carl K.; and Temme, Karl, 4,295,300, Cl. 51-163.200.
Carle, Pierre R.: *See*—
Joly, Robert; Pavan, Charles; and Carle, Pierre R., 4,296,091, Cl. 424-18.000.
Carlson, Alfred D.: *See*—
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,295,244, Cl. 15-320.000.
Carlson, David H. J., to UOP Inc. Catalytic composite, method of manufacture and process for use. 4,295,993, Cl. 252-430.000.
Carlson, Lawrence E., to Aluminum Company of America. Nestable building wall panel. 4,295,316, Cl. 52-588.000.
Carmody, Michael, to Baker International Corporation. Selective lock with setting and retrieving tools. 4,295,528, Cl. 166-315.000.
Carniti, Sergio: *See*—
Buzzi, Fabio; and Carniti, Sergio, 4,295,834, Cl. 440-76.000.
Carrier Corporation: *See*—
Hannett, William J.; Brendel, Thomas E.; and Wilson, David S., 4,295,344, Cl. 62-324.500.
Nakahama, Syuhei; and Yamashita, Etsu, 4,296,308, Cl. 219-136.000.
Carroll, Noel; and Carroll, William F. Revolving security door. 4,295,297, Cl. 49-42.000.
Carroll, William F.: *See*—
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Carson, Don B., to UOP Inc. Process for the manufacture of ethanol from ethylene. 4,296,261, Cl. 568-890.000.
Casciotti, Albert: *See*—
Vanderheyden, Eric E.; and Casciotti, Albert, 4,296,390, Cl. 333-182.000.
Cassedy, Kevin H.: *See*—
Blincow, Donald W.; Cassedy, Kevin H.; and Dominey, Samuel C., Jr., 4,296,321, Cl. 250-254.000.
Catanzarite, Vincent O. Coating for lithium anode, thionyl chloride active cathode electrochemical cell. 4,296,185, Cl. 429-48.000.
Caterpillar Tractor Co.: *See*—
Cemenska, Richard A.; and Grim, George B., 4,295,449, Cl. 123-300.000.
Ellington, Rayburn P., III, 4,295,276, Cl. 33-181.00R.
Garman, Ronald H., 4,295,306, Cl. 52-208.000.
Rubenthaler, Randall J., 4,295,691, Cl. 308-238.000.
Sommars, Mark F., 4,295,521, Cl. 165-69.000.
Stevens, Samuel B., 4,295,916, Cl. 156-397.000.
Cavalla, John F.: *See*—
Bushnell, Brian J.; Cavalla, John F.; Shepherd, Robin G.; and White, Alan C., 4,296,029, Cl. 260-239.30R.
Ceintrey, Marcel. Compositions for use in seal coats. 4,296,167, Cl. 428-284.000.
Celanese Corporation: *See*—
Chen, John C.; and Davis, Herbert L., 4,296,058, Cl. 264-78.000.
Rhum, David, 4,296,225, Cl. 526-260.000.
Warner, Steven B., 4,295,844, Cl. 8-115.500.
Cemenska, Richard A.; and Grim, George B., to Caterpillar Tractor Co. Rotary fuel injection with sequencing. 4,295,449, Cl. 123-300.000.
Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See*—
Defourny, Jacques, 4,296,304, Cl. 219-86.410.
Economopoulos, Marios, 4,295,902, Cl. 148-144.000.
Centro Ricerche Fiat S.p.A.: *See*—
Milana, Emilio; and Rasello, Franco, 4,296,333, Cl. 250-572.000.
Centromint Company Establishment: *See*—
Haas, Eduard, 4,295,579, Cl. 221-229.000.
Certain-teed Corporation: *See*—
Kopenhaver, Robert, 4,295,445, Cl. 118-695.000.
CHA Industries: *See*—
Mahl, Gunard O. B., 4,296,153, Cl. 427-444.000.
Chambers Corporation: *See*—
Scherer, Richard M., 4,295,261, Cl. 29-451.000.
Champion International Corporation: *See*—
Cooley, James; and Fogle, Ozzie, 4,295,910, Cl. 156-314.000.
Chance, Davey J.: *See*—
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,296,302, Cl. 219-69.00G.
Charbonnages de France: *See*—
Nomine, Michel; and Chelu, Gerard, 4,296,081, Cl. 423-245.000.
Checko, John C. Apparatus for applying sealant material to a workpiece. 4,295,914, Cl. 156-357.000.
Chelu, Gerard: *See*—
Nomine, Michel; and Chelu, Gerard, 4,296,081, Cl. 423-245.000.
Chen, John C.; and Davis, Herbert L., to Celanese Corporation. Process for enhancing the uniformity of dye uptake of false twist texturized polyethylene terephthalate fibrous materials. 4,296,058, Cl. 264-78.000.
Chevreux, Pierre: *See*—
Roman, Alain; Chevreux, Pierre; Wust, Manfred; and Ehretsmann, Jacques, 4,295,948, Cl. 204-159.230.
Chevron Research: *See*—
Edwards, Laroy H., 4,295,874, Cl. 71-67.000.
Hudson, Robert L., 4,296,022, Cl. 260-42.460.
Chevron Research Company: *See*—
Farnham, Robert A., 4,295,936, Cl. 202-153.000.
Chielens, Alain; and Boussekey, Bernard, to Fives-Cail Babcock. System for the protection of the delivery end of a rotary kiln. 4,295,825, Cl. 432-116.000.
Childs, Michael E., to UOP Inc. Multifunctional gasoline additives. 4,295,860, Cl. 44-63.000.
Chiyoda Kako Kensetsu Kabushiki Kaisha: *See*—
Kurima, Akinori; Iwase, Yasuhiro; and Kimiwada, Tadao, 4,295,967, Cl. 210-189.000.
Chlorine Engineers Corp., Ltd.: *See*—
Fuseya, Shigeaki; and Ichisaka, Teruo, 4,295,953, Cl. 204-257.000.
Chow, Weichien, to Bunker Ramo Corporation. Electrical connector housing. 4,295,698, Cl. 339-59.00R.
Christensen, Burton G.; Johnston, David B. R.; and Firestone, Raymond A., to Merck & Co., Inc. 7-(or 6-) Substituted-7-(or 6-)acylimino cephalosporin (or penicillin) compounds. 4,296,236, Cl. 542-420.000.
Christensen, Burton G.: *See*—
Beattie, Thomas R.; Christensen, Burton G.; and Dininno, Frank P., 4,296,111, Cl. 424-246.000.
Christinger, Werner, to Becton, Dickinson and Company. Multiple sampling device having molded valve and hub. 4,295,477, Cl. 128-766.000.
Chupp, John P.: *See*—
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Jaquith, Jack B.; and Church, Allen R., 4,296,140, Cl. 426-575.000.
Ciba-Geigy AG: *See*—
Trautweiler, Franz, 4,296,198, Cl. 430-403.000.

Ciba-Geigy Corporation: *See*—
Browne, Leslie J., 4,296,115, Cl. 424-263.000.
Di Benedetto, Marianne, 4,296,005, Cl. 260-18.0EP.
Gutekunst, Ferdinand; and Schmid, Rolf, 4,296,231, Cl. 528-93.000.
Haberli, Roland; Mollet, Hans; and Scherer, Gustaaf, 4,295,850, Cl. 8-524.000.
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,296,118, Cl. 424-273.00P.
Neumann, Konrad; Schenkenberger, Ernst; and Resch, Friedrich, 4,295,851, Cl. 8-524.000.
Petitpierre, Jean C.; and Garner, Robert, 4,295,663, Cl. 282-27.500.
Sallmann, Alfred; and Goschke, Richard, 4,296,128, Cl. 424-309.000.

Ciliberti, Frank L., Jr., to Duracell International Inc. One piece connector. 4,295,705, Cl. 339-220.00R.

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Cioca, Gheorge; and Siegler, Marcel, to Seton Company. Method of preparing soluble collagen fibers. 4,295,894, Cl. 106-155.000.

Cisternino, Andrew J.: *See*—
Cottrill, William P.; and Cisternino, Andrew J., 4,295,775, Cl. 414-375.000.

Citizen Watch Company Limited: *See*—
Nakayama, Yasuaki, 4,296,488, Cl. 368-80.000.
Nishikubo, Yasuhiko, 4,296,490, Cl. 368-87.000.

Citron, Jeffrey M. Flexible V-shaped solar tracking concentrating solar energy collector. 4,295,463, Cl. 126-425.000.

Clark, Eugene A.; and Zubkewych, Morris. Football gloves. 4,295,229, Cl. 2-20.000.

Clark, Lancelot P., to Clarks Limited. Footwear. 4,295,238, Cl. 12-142.0RS.

Clarke, Charles J., Jr.: *See*—
Woods, Rodney G.; Clarke, Charles J., Jr.; and Sodergren, Robert C., 4,296,464, Cl. 364-200.000.

Clarks Limited: *See*—
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Clayton, Edward R. C.; and Bennett, Alan F., to Spirax Sarco Limited. Steam traps. 4,295,605, Cl. 236-56.000.

Clebant, Jean C., to Societe Europeenne de Propulsion. Flexible union with passive compensation. 4,295,671, Cl. 285-223.000.

Clemens, Lawrence G., to Phillips Petroleum Company. Tilt alarm in a seismic exploration system. 4,296,485, Cl. 367-77.000.

Clemens, Ronald: *See*—
Maier, Martin; Purrer, Josef; and Clemens, Ronald, 4,295,323, Cl. 56-10.200.

Clements, Lloyd W. Irrigation sprinklers. 4,295,610, Cl. 239-230.000.

Clouser, Michael T., to Emhart Industries, Inc. Means controlling a flue damper. 4,295,603, Cl. 236-1.00G.

Cohen, Jacques: *See*—
Ingrain, Raymond A.; and Cohen, Jacques, 4,296,396, Cl. 337-66.000.

Cole, Marc. Desalination with improved chlor-alkali production by electrolyticdialysis. 4,295,950, Cl. 204-180.00P.

Coles, Carl R., to Zero-Seal, Inc. Pressure-compensated diaphragm seals for actuators, with self-equalization. 4,295,653, Cl. 277-2.000.

Colgate-Palmolive Company: *See*—
Pierce, Robert C., 4,296,096, Cl. 424-52.000.

Collura, Peter C.: *See*—
Baker, Thomas R.; and Collura, Peter C., 4,295,839, Cl. 493-143.000.

Colt Industries Operating Corp: *See*—
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,296,302, Cl. 219-69.00G.

Combustion Engineering, Inc.: *See*—
Anthony, Andrew J., 4,295,935, Cl. 376-285.000.

Comizzoli, Robert B.; and Vibronek, Robert D., to RCA Corporation. Method of detecting a thin insulating film over a conductor. 4,296,370, Cl. 324-54.000.

Commissariat a l'Energie Atomique: *See*—
LeClou, Andre, 4,295,620, Cl. 248-154.000.

Compact Video Systems Inc.: *See*—
Holland, Kenneth F., 4,296,431, Cl. 358-12.000.

Conair Corporation: *See*—
Tomaro, Patrick M., deceased, 4,295,283, Cl. 34-97.000.

Concast AG: *See*—
Gloor, Hans, 4,295,278, Cl. 33-182.000.

Condie, Richard M., to University of Minnesota, The Regents of the. Pure intravenous human and animal gamma globulins. 4,296,027, Cl. 260-112.00B.

Conoco Inc.: *See*—
Jones, Emrys H., Jr.; and Lauer, Stephen D., 4,295,536, Cl. 175-214.000.
Motz, Kaye L., 4,295,980, Cl. 252-8.55D.
Ziegenhain, William C., 4,296,057, Cl. 264-63.000.

Conradty GmbH & Co. Metallelektroden KG: *See*—
Koziol, Konrad; and Wenk, Erich, 4,295,942, Cl. 204-96.000.

Construction Specialties, Inc.: *See*—
Lynn-Jones, David M.; and Stewart, R. Gordon, 4,295,315, Cl. 52-573.000.

Conti, Allen C. Tube with weakened side wall segment. 4,296,157, Cl. 428-36.000.

Continental Group, Inc., The: *See*—
Gerber, Howard L., 4,296,293, Cl. 219-8.500.

Control Data Corporation: *See*—
Hutson, Maurice L., 4,296,477, Cl. 364-900.000.

Conzelmann, Gerhard: *See*—
Knopp, Hans; Herion, Dieter; Conzelmann, Gerhard; and Gehrig, Heinz, 4,295,253, Cl. 28-255.000.

Cook, Gerald L.: *See*—
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.

Cookson, Alan H., to United States of America, Energy. High voltage bushing having weathershed and surrounding stress relief collar. 4,296,274, Cl. 174-142.000.

Cooley, James; and Fogle, Ozzie, to Champion International Corporation. Process for production of vinyl film-cellulosic laminates and laminates produced thereby. 4,295,910, Cl. 156-314.000.

Cooper, Alan: *See*—
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Cooper, Julius, to Ideal Toy Corporation. Toy miniature vehicle racing game. 4,295,649, Cl. 273-86.00B.

Copal Company Limited: *See*—
Inoue, Nobuyoshi, 4,295,726, Cl. 354-246.000.

Cordts, Howard P.; and Karloske, Joan E., to Freeman Chemical Corporation. Method of making glass fiber reinforced laminate. 4,295,907, Cl. 156-246.000.

Corinco, Inc.: *See*—
Frantello, Alfred A.; and Kefauver, Lester R., 4,295,324, Cl. 56-12.700.

Cornell, William D., to Sherwood Medical Industries Inc. Blood sample collection and phase separation device. 4,295,974, Cl. 210-789.000.

Corning Glass Works: *See*—
Luers, George A., 4,295,872, Cl. 65-30.110.
Wu, Che-Kuang, 4,296,479, Cl. 365-119.000.

Cosentino, Cesare C.: *See*—
Madonia, Ciro N.; Hatzikelis, Christopher; and Cosentino, Cesare C., 4,296,155, Cl. 428-31.000.

Cottrill, William P.; and Cisternino, Andrew J., to Evacuators, Inc. Unloader for hopper cars and method. 4,295,775, Cl. 414-375.000.

Couchman, James C., to General Dynamics Corporation. Fastener incorporating removable ultrasonic transducer. 4,295,377, Cl. 73-761.000.

Cowell, Mark J., to Beckman Instruments, Inc. Centrifuge tube holder. 4,295,601, Cl. 233-26.000.

Cox, Russell C.: *See*—
Louthan, Jean H.; Cox, Russell C.; and Crawford, William V., 4,295,668, Cl. 285-21.000.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dihydro-6,7-disubstituted-5-(acyl)benzofuran-2-carboxylic acids. 4,296,122, Cl. 424-285.000.

Cragoe, Edward J., Jr., to Merck & Co., Inc. 4-(Pyridyl, piperazinyl and thiazolyl substituted thiazolyl)-3-hydroxy-3-pyrroline-2,5-diones. 4,296,237, Cl. 544-405.000.

Cramer, John J.: *See*—
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Cranston, Douglas R.: *See*—
Zangari, Dominic V.; and Cranston, Douglas R., 4,295,436, Cl. 113-80.00D.

Crase, Gary M.; and Trzeciak, Kurt M., to Smith International, Inc. In-hole motor drill with locking bit clutch. 4,295,535, Cl. 175-101.000.

Crawford, William V.: *See*—
Louthan, Jean H.; Cox, Russell C.; and Crawford, William V., 4,295,668, Cl. 285-21.000.

Creative Tool Company: *See*—
Dooley, Joseph L.; and Dooley, Daniel J., 4,295,364, Cl. 73-119.00A.

Cristofori, Manlio: *See*—
Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, 4,296,125, Cl. 424-315.000.

Crompton & Knowles Corporation: *See*—
Hodddinott, David C., 4,295,812, Cl. 425-114.000.

Cross, Billy J., to Cross, Billy J. Material handling apparatus. 4,295,560, Cl. 198-517.000.

Cucinella, Salvatore; Mazzei, Alessandro; and Dozzi, Giovanni, to Snamprogetti S.p.A. Process for the preparation of poly-(-N-alkyliminoalanes). 4,296,045, Cl. 260-448.00R.

Cugini, John J.: *See*—
Cugini, Larry, Sr.; and Cugini, John J., 4,295,275, Cl. 33-1.00G.

Cugini, Larry, Sr.; and Cugini, John J. Method and apparatus for making raised and flat letter signs. 4,295,275, Cl. 33-1.00G.

Cullison, Steven B.; and Slack, Charles B., to Altec Corporation. Loudspeaker overload protection circuit. 4,296,278, Cl. 179-1.0VL.

Cummings, J. Francis; and Werner, Alfred O. Friction heat generator apparatus. 4,295,461, Cl. 126-247.000.

Cunniff, James J. Plug cutter. 4,295,763, Cl. 408-86.000.

Curts, Julius: *See*—
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.

Cuscurida, Michael; and Speranza, George P., to Texaco Inc. Polyurethane foams using a polyurea polymer polyol. 4,296,213, Cl. 521-166.000.

Cutler, Barry L. Framework holder for attaching container to floor machine. 4,295,622, Cl. 248-313.000.

Cutting, Gloria T. Medication record-keeping package. 4,295,664, Cl. 283-1.00A.

Dabisch, Kenneth W.; and Richards, John S., to Rockwell International Corporation. Non-contact counter. 4,296,314, Cl. 235-92.0SB.

Dahlberg, Anders, to Tatis Plasttatningar AB. Expansion joint element. 4,295,311, Cl. 52-396.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Hoshino, Masaru, 4,296,068, Cl. 422-62.000.
Dai Nippon Toryo Co., Ltd.: *See—*
Hayashi, Masaaki; Sasaki, Hiroharu; and Tsuneta, Kazuyoshi, 4,296,014, Cl. 260-29.6NR.
Daicel Ltd.: *See—*
Sato, Kazuo, 4,296,243, Cl. 560-210.000.
Daikin Kogyo Co., Ltd.: *See—*
Fukui, Shosin; and Akazawa, Tadashi, 4,296,224, Cl. 526-243.000.
Ohsaka, Yohnosuke; and Tohzuka, Takashi, 4,296,265, Cl. 570-138.000.
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Daly, James E. Game and article for use therewith. 4,295,647, Cl. 273-1.00G.
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Dambach, Thomas F.; and Ricketts, James R., to Marquette Electronics, Inc. Chart recorder having pressurized ink supply and Z fold paper feed and improved chart recording method. 4,296,420, Cl. 346-140.00R.
Damon, Robert E., II, to Sandoz, Inc. Silacycloalkane amides. 4,296,240, Cl. 556-406.000.
Daneffel, Hansruedi, to Feller AG. Electronic voice detector. 4,296,277, Cl. 179-1.0VC.
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Data General Corporation: *See—*
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Ashfield, Herbert E.; Horsfall, Harry; and Wade, Philip M., 4,295,530, Cl. 172-7.000.
Davis, Charles D., to Armstrong World Industries, Inc. Gripper shuttles. 4,295,498, Cl. 139-196.200.
Davis, Harry C. Circular insulation saw system. 4,295,263, Cl. 29-561.000.
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Davis, William O., to AAI Corporation. Rocket assisted projectile and cartridge arrangement with pressure relief skirt. 4,295,425, Cl. 102-326.000.
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Stauffer, Adolf, 4,296,088, Cl. 423-533.000.
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Marsh, Richard L., 4,295,837, Cl. 474-153.000.
de la Vega, Alejandro J. Apparatus and method for handling jackets of printed matter. 4,295,643, Cl. 270-57.000.
DeCaro, Charles J., to Textron Inc. Installation tool barrel assembly. 4,295,394, Cl. 81-57.370.
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Mayer, Steven T.; Miner, Jay G.; Neubauer, Douglas G.; and Decuir, Joseph C., 4,296,476, Cl. 364-900.000.
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Meyer, Stephen T., 4,295,571, Cl. 211-200.000.
Defourny, Jacques, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Electrode displacement monitoring in resistance welding. 4,296,304, Cl. 219-86.410.
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Dehn, Rudolph A.: *See—*
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DeMaria, Francesco, to American Cyanamid Company. Pressure sealing process. 4,296,059, Cl. 264-130.000.
De Maria, Francesco; and Pfeiffer, Ronald E., to American Cyanamid Company. Hollow acrylonitrile polymer fiber. 4,296,175, Cl. 428-398.000.
De Matteo, John; and Villani, Frank, to United States of America, Navy. Gravity measurement apparatus for ships. 4,295,372, Cl. 73-382.00G.
Denerley, Paul M., to Beecham Group Limited. Method for the preparation of penicillanic-β-lactamase inhibitors. 4,296,032, Cl. 260-245.20R.
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Dennesen, Francis G.; Wilson, Richard S.; Toulan, Roy D., Jr.; and Madnick, Peter, to Dennesen Electronics Inc. Stylus positioner. 4,295,277, Cl. 33-181.00R.
de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, to Oronzio deNora Impianti Elettrochimici S.p.A. Novel cationic membranes. 4,295,952, Cl. 204-252.000.
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DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,296,011, Cl. 260-29.300.
Desprez, Alfred; Sauerland, Heinz; and Teetz, Wolfgang, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Take-up drive for a multi-head embroidery machine. 4,295,433, Cl. 112-241.000.
Dessaint, Andre L.; and Perronin, Jean, to Produits Chimiques Ugine Kuhlmann. Fluorinated anti-stain and soil release finishes. 4,295,976, Cl. 252-8.900.
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d'Hautecourt, Alain H.; Bretl, Wayne E.; and Lee, Ronald B., to Zenith Radio Corporation. Luminance signal processing circuit. 4,296,435, Cl. 358-166.000.
Dhondt, Roland O., to Union Oil Company of California. Apparatus and method for introducing solids into a solids upflow vessel. 4,295,773, Cl. 414-187.000.
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Diamond, George; Forrester, James; Hirsch, Michael; and Vas, Ran. Apparatus and method for analysis of motion of a dynamic structure. 4,295,473, Cl. 178-695.000.
Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,296,264, Cl. 570-128.000.
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Di Benedetto, Marianne, to Ciba-Geigy Corporation. Adducts containing hydroxyl groups from mononuclear hydantoin glycidyl compounds and non-aromatic dicarboxylic acids. 4,296,005, Cl. 260-18.0EP.
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Dickhart, William W., III; and Marvin, Richard H., to Budd Company, The. Steerable truck for a railway vehicle. 4,295,428, Cl. 105-168.000.
Diehl GmbH & Co.: *See*—
Rhau, Siegfried; and Weber, Adolf, 4,296,180, Cl. 428-558.000.
Dietze, Robert H.: *See*—
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Ho, T. L.; and Din, Zia U., 4,296,038, Cl. 260-343.210.
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Disko, Harry: *See*—
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Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.
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Dixon Valve & Coupling Co.: *See*—
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Dixon, William. Corner beading cleaner. 4,295,242, Cl. 15-235.700.
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Dr. Johannes Heidenhain GmbH: *See*—
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Docutronix, Inc.: *See*—
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Dodds, Dennis L., to RCA Corporation. Television display error correction. 4,296,359, Cl. 315-370.000.
Dodds, Robert J., to International Computers Limited. Electrical connectors. 4,295,695, Cl. 339-17.00F.
Dodge, Paul D.: *See*—
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,295,244, Cl. 15-320.000.
Doerer, Daniel M.; and Brunkhorst, Lloyd E., to Brown Group, Inc. Method of making foamed plastisol insoles for shoes. 4,296,053, Cl. 264-26.000.
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Dooley, Joseph L.; and Dooley, Daniel J., to Creative Tool Company. Transducer device for monitoring of fuel injection. 4,295,364, Cl. 73-119.00A.
Dorman Smith Traffic Products Limited: *See*—
Minoprio, William E.; and Horsfield, Arthur K., 4,296,460, Cl. 362-200.000.
Doten, Bradford O.; and Svitak, John J., to Western Electric Company, Inc. Methods and apparatus for bonding an article to a metallized substrate. 4,295,596, Cl. 228-180.00A.
Douthett, Joseph A.; and Espy, Ronald H., to Armco Inc. Copper and nitrogen containing austenitic stainless steel and fastener. 4,295,769, Cl. 411-411.000.
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Harris, Wilford D., 4,296,055, Cl. 264-45.500.
Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., 4,296,159, Cl. 428-95.000.
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Draggoo, Vaughn G., to Jersey Nuclear-Avco Isotopes, Inc. Thermally improved dye laser flow channel. 4,296,388, Cl. 331-94.50L.
Dragomir, Stojicic. Boxing gloves without a seam on the frontal strike portion thereof. 4,295,228, Cl. 2-18.000.
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Dresser Industries, Inc.: *See*—
Purton, Robert M., 4,295,487, Cl. 137-242.000.
Drewery, John O.; and Storey, Richard, to British Broadcasting Corporation. Method of and apparatus for movement portrayal with a raster e.g. television, display. 4,296,434, Cl. 358-105.000.
Drori, Mordeki. Backwashable fluid filter. 4,295,963, Cl. 210-108.000.
Droux, Michel; and Bocquet, Gilbert, to Saint-Gobain Industries. Sizing composition and glass fibers treated with the aid of such composition. 4,295,871, Cl. 65-3.410.
Dubbink, David T.; and Vogler, Lynda L. Orthopedic chair. 4,295,683, Cl. 297-377.000.
Duchardt, Karl H.; and Gehrke, Gunter, to Bayer Aktiengesellschaft. Process for the preparation of cationic anthraquinone dyestuffs. 4,296,044, Cl. 260-381.000.
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Duke, Steven R.: *See*—
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Hanzel, Robert S.; and Sauer, Paul J., 4,296,174, Cl. 428-389.000.
Johnson, Alexander L., 4,296,110, Cl. 424-244.000.
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Robinson, Bruce A.; and Thompson, John R., 4,295,252, Cl. 28-248.000.
Windley, William T., 4,295,329, Cl. 57-245.000.
Dupuy, James A. Cable dead ending. 4,295,250, Cl. 24-122.600.
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Duran, John A., to Avibank Mfg., Inc. Latch mechanism. 4,295,674, Cl. 292-190.000.
Durand, Roger, to Pignons S.A. Photographic shutter. 4,295,725, Cl. 354-244.000.
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Trutner, Donald G.; and Thorington, Luke, 4,295,873, Cl. 65-108.000.
DuRocher, Gideon A., to Essex International, Inc. Pressure sensitive combination switch and circuit breaker construction. 4,295,699, Cl. 339-61.00M.
Dussourd, Jules L.; and Pfannebecker, George W., to Terry Corporation. Turbine wheel and nozzle arrangement. 4,295,788, Cl. 415-202.000.
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Gauchel, Peter; and Wissinger, Waldemar, 4,296,062, Cl. 264-173.000.
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Breen, John J., 4,295,715, Cl. 354-25.000.
Edwards, Evan A., 4,295,713, Cl. 352-235.000.
Montalto, Michael S.; Blanding, Douglass L.; and Smith, Michael R., 4,296,070, Cl. 422-65.000.
Smith, Michael R.; and DiFulvio, Anthony P., 4,296,069, Cl. 422-64.000.
Eaton, Sargent S., Jr.; and Schroeder, Paul R., to Mostek Corporation. Refresh counter. 4,296,480, Cl. 365-222.000.
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Economopoulos, Marios, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Method of manufacturing rolled steel products with high elastic limit. 4,295,902, Cl. 148-144.000.

Edwards, Evan A., to Eastman Kodak Company. Film and photographic apparatus. 4,295,713, Cl. 352-235.000.

Edwards, Laroy H., to Chevron Research. N-Alkyl or aryl-N-(trichlorovinylthio)-halomethane sulfonamides. 4,295,874, Cl. 71-67.000.

Efimov, Vyacheslav T.: *See—*
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Eichelberger, Charles W.; Dehn, Rudolph A.; and Wojnarowski, Robert J., to General Electric Company. Controllable-duty-cycle power supply for microwave oven magnetron and the like. 4,296,296, Cl. 219-10.55B.

Eichelberger, Charles W., to General Electric Company. Relay switching apparatus. 4,296,449, Cl. 361-3.000.

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Eicken, Karl; Rohr, Wolfgang; Pander, Hans J.; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Tetrahydro-1,3-oxazines. 4,295,875, Cl. 71-88.000.

Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, to Canon Kabushiki Kaisha. Recording liquid composition. 4,295,889, Cl. 106-22.000.

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Ekman, C. Frederick W.: *See—*
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Eldeen, Gene H. Newal post assembly. 4,295,638, Cl. 256-59.000.

Electric Power Research Institute, Inc.: *See—*
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Ellington, Rayburn P., III, to Caterpillar Tractor Co. Template for aligning a shaft. 4,295,276, Cl. 33-181.00R.

Elmendorf Research, Inc.: *See—*
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Elsner, Ernst: *See—*
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Eltra Corporation: *See—*
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Eltvedt, Frank. Guide skirt. 4,295,815, Cl. 425-556.000.

Emerson Electric Co.: *See—*
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Hildebrandt, Eugene F.; and Ottersbach, Thomas V., 4,296,366, Cl. 318-793.000.
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Emhart Industries, Inc.: *See—*
Bristol, Robert G., 4,295,370, Cl. 73-304.00C.
Clouser, Michael T., 4,295,603, Cl. 236-1.00G.
Miller, Theodore H., 4,295,673, Cl. 292-21.000.

Emi, Shingo; and Saiki, Noritsugu, to Teijin Limited. Fibrous composite having elasticity. 4,296,163, Cl. 428-212.000.

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Engel, Christopher M.; and Srivastava, Gopal K., to Zenith Radio Corporation. Dynamic enabling network for a color correction circuit. 4,296,432, Cl. 358-28.000.

Engelhard Min. & Chem. Corp.: *See—*
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Engelke, Roger P., to Barber-Colman Company. Method and apparatus for reducing torque on an air damper. 4,295,632, Cl. 251-127.000.

Engineered Systems, Inc.: *See—*
Sheldon, James R., 4,296,404, Cl. 340-149.00A.
Weimer, Dan G.; and Van Ness, Bradford O., 4,296,315, Cl. 235-460.000.

English Electric Valve Company: *See—*
Esterson, Maurice; and Brady, Michael B. C., 4,296,385, Cl. 331-90.000.

Enomoto, Kazuyoshi: *See—*
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.

Enomoto, Satoru; Asano, Kiro; and Tanaka, Hiromitsu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Conjugate of amino sugar-steroid hormone. 4,296,233, Cl. 536-5.000.

Epoxon Products, Inc.: *See—*
Wilson, Thomas T., 4,295,460, Cl. 126-121.000.

EPP Corp.: *See—*
Lennon, Donald J. J.; Hagerstrom, John R.; and Ekman, C. Frederick W., 4,296,176, Cl. 428-407.000.

Erb, Tom L.; and Miller, Wendell D., to Ramsey Engineering Company. Method and apparatus for flow measurement using Doppler frequency shift. 4,295,378, Cl. 73-861.250.

Eriksson, Leif; and Liberman, Salomon, to Asea Aktiebolag. Multiphase fault protection circuitry with variable functional level detection. 4,296,452, Cl. 361-82.000.

Erlach, Hans, to Sulzer Brothers Limited. Means for coupling a hand drive with a rotatable shaft. 4,295,552, Cl. 192-81.00C.

Eroshevskaya, Elena D., administrator: *See—*
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.

Errichiello, Dominic R. Integrally molded, looseleaf books with ring-binder-mounting posts molded on spine. 4,295,747, Cl. 402-75.000.

Erwin Sick GmbH, Optik-Elektronik: *See—*
Sick, Erwin, 4,295,743, Cl. 356-431.000.

Esperling, Peter: *See—*
Laurent, Henry; Esperling, Peter; Kapp, Joachim-Friedrich; and Wiechert, Rudolf, 4,296,109, Cl. 424-241.000.

Espy, Ronald H.: *See—*
Douthett, Joseph A.; and Espy, Ronald H., 4,295,769, Cl. 411-411.000.

Essex International, Inc.: *See—*
DuRocher, Gideon A., 4,295,699, Cl. 339-61.00M.

Esterson, Maurice; and Brady, Michael B. C., to English Electric Valve Company. X-Ray assisted multipactor discharge tuned resonant cavity device. 4,296,385, Cl. 331-90.000.

Etablissements Boucher Freres: *See—*
Boucher, Pierre, 4,295,641, Cl. 269-136.000.

Ethyl Corporation: *See—*
Papay, Andrew G.; and O'Brien, Joseph P., 4,295,983, Cl. 252-49.600.

Etzold, Roland; Impellizzeri, Julius S.; and Vaughan, Thomas W., to Elmendorf Research, Inc. Apparatus and method for aligning elongated ligno-cellulosic strands into parallelism. 4,295,557, Cl. 198-382.000.

Eue, Ludwig: *See—*
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.

Evacuators, Inc.: *See—*
Cottrill, William P.; and Cisternino, Andrew J., 4,295,775, Cl. 414-375.000.

Evans, Robert F.: *See—*
Adams, John E.; Evans, Robert F.; and Gavin, John H., 4,295,254, Cl. 29-33.00M.

Evers, Jack R., to Developak Corporation. Tube side seam heat sealer. 4,295,922, Cl. 156-583.100.

Ewen, James H.; and McClellan, Thomas R., to Upjohn Company, The. Elastomeric polyurethane-polyurea polymer prepared from an organic polyisocyanate a polyol and an aromatic diamine having at least one of the ortho positions to each amine lower alkyl. 4,296,212, Cl. 521-163.000.

Ewins, Earle E., Jr.: *See—*
St. Clair, David J.; and Ewins, Earle E., Jr., 4,296,008, Cl. 260-27.0BB.

Exploration Company: *See—*
Weiss, Benjamin F. L., 4,296,481, Cl. 367-20.000.

Exxon Research & Engineering Co.: *See—*
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,295,995, Cl. 252-431.00C.
Bearden, Roby, Jr.; Aldridge, Clyde L.; and Pine, Lloyd A., 4,295,996, Cl. 252-431.00C.
Mauldin, Charles H.; and Baird, William C., Jr., 4,295,957, Cl. 208-138.000.
Mauldin, Charles H.; and Baird, William C., Jr., 4,295,958, Cl. 208-138.000.
Metrailer, William J., 4,295,956, Cl. 208-127.000.
Rosensweig, Ronald E., 4,296,080, Cl. 423-244.000.
Wristers, Harry J., 4,295,991, Cl. 252-429.00B.

Fabris, Mario. Roller entry guides for rod mills. 4,295,356, Cl. 72-250.000.

Fagersta AB: *See—*
Malmgren, Nils-Gunnar; Solly, Barry; and Tarnblom, Stig, 4,295,900, Cl. 148-12.00B.

Fahey, Dennis M., to PPG Industries, Inc. Glass fibers with reduced tendency to form gumming deposits and sizing composition comprising two starches with different amylose content. 4,296,173, Cl. 428-378.000.

Fahrig, Robert J.; and Hinrichs, Lansing M., to Standard Oil Company (Indiana). Method and apparatus for improved fluid catalytic riser reactor cracking of hydrocarbon feedstocks. 4,295,961, Cl. 208-161.000.

Fairchild, Peter T.; and Leininger, Joel C., to International Business Machines Corp. Link register storage and restore system for use in an instruction pre-fetch micro-processor interrupt system. 4,296,470, Cl. 364-200.000.

Falk, Edward J., to Wagner Electric Corporation. Master cylinder assembly with detachable reservoir. 4,295,336, Cl. 60-562.000.

Farfaglia, Silvio T., to Phillips Petroleum Company. Container spinning apparatus for container manufacturing machine or the like. 4,295,903, Cl. 156-69.000.

Farnham, Robert A., to Chevron Research Company. Fractionation apparatus providing improved heat recovery from bottom stream. 4,295,936, Cl. 202-153.000.

Faust, Raimund J., to Hoechst Aktiengesellschaft. Photopolymerizable mixture in a transfer element. 4,296,196, Cl. 430-271.000.

Fehr, Charles; Ohloff, Gunther; and Buchi, Georges H., to Firmenich SA. Process for the preparation of macrocyclic ketones. 4,296,258, Cl. 568-364.000.

Feller AG: *See*—
Daneffel, Hansruedi, 4,296,277, Cl. 179-1.0VC.

Fensom, Donald J., to ICI Australia Limited. Processes of iron segregation. 4,295,878, Cl. 75-1.00T.

Ferguson, Stewart. Shouldered shake and filler roof structure. 4,295,314, Cl. 52-553.000.

Ferris, Ray: *See*—
Knippel, Willis H.; and Ferris, Ray, 4,295,430, Cl. 105-308.00E.

Feuerbaum, Hans-Peter, to Siemens Aktiengesellschaft. Techniques for impressing a voltage with an electron beam. 4,296,372, Cl. 324-71.0EB.

F'Geppert, Erwin, to United States of America, Army. Shaft-component connection means. 4,295,750, Cl. 403-259.000.

Fidia S.p.A.: *See*—
Della Valle, Francesco, 4,296,039, Cl. 260-343.450.

Fiegel, Joachim: *See*—
Walz, Klaus; and Fiegel, Joachim, 4,295,852, Cl. 8-560.000.

Finsterwalder, Kurt; Philipp, Karl-Heinz; Riedisser, Gunter; and Voss, Wilfried, to L. Schuler GmbH. Apparatus for intermittent feeding of web-type or strip-type material. 4,295,399, Cl. 83-251.000.

Firestone, Raymond A.: *See*—
Christensen, Burton G.; Johnston, David B. R.; and Firestone, Raymond A., 4,296,236, Cl. 542-420.000.

Firmenich SA: *See*—
Fehr, Charles; Ohloff, Gunther; and Buchi, Georges H., 4,296,258, Cl. 568-364.000.

Fischell, Robert E., to Johns Hopkins University, The. Recorder with patient alarm and service request systems suitable for use with automatic implantable defibrillator. 4,295,474, Cl. 128-697.000.

Fischli, Albert E.; and Szente, Andre, to Hoffmann-La Roche Inc. Benzodiazepine derivatives. 4,296,031, Cl. 260-239.30D.

Fisher Controls Company, Inc.: *See*—
Arends, Roger R.; Bailey, Wayne B.; Duffy, John W.; and Springer, Brice D., 4,295,489, Cl. 137-488.000.

Fisher Scientific Company: *See*—
Bernier, John A., 4,296,358, Cl. 315-241.00R.

Fisons Limited: *See*—
Appleton, Richard A.; and Johnston, David, 4,296,114, Cl. 424-248.520.

Fitzgerald, Stella; and Beaver, Bryan, to Beaver, Bryan. Demolition derby toy. 4,295,292, Cl. 46-201.000.

Fives-Cail Babcock: *See*—
Chielens, Alain; and Boussekey, Bernard, 4,295,825, Cl. 432-116.000.

Flachbarth, Charles T., to Butler Manufacturing Co. Surface raceway box. 4,295,575, Cl. 220-3.920.

Flemings, Merton C.; and Goodwin, Frank E., to Massachusetts Institute of Technology. Method for making metal alloy compositions and composition. 4,295,896, Cl. 148-1.000.

Floessel, Carl D., to BBC Brown, Boveri & Company Limited. Gas insulated high voltage line and method of assembling same. 4,296,271, Cl. 174-28.000.

FMC Corporation: *See*—
Buchta, Ervin A., 4,295,390, Cl. 74-625.000.

Fogle, Ozzie: *See*—
Cooley, James; and Fogle, Ozzie, 4,295,910, Cl. 156-314.000.

Follett Corporation: *See*—
Hornbeck, Clarence J., 4,295,309, Cl. 52-309.700.

Forlenza, Nicholas G., to Mateflex/Mele Corporation. Method of zoning grate surfaces. 4,296,160, Cl. 428-117.000.

Forrester, James: *See*—
Diamond, George; Forrester, James; Hirsch, Michael; and Vas, Ran, 4,295,473, Cl. 178-695.000.

Forstner, Anton; and Schatzmann, Kurt, to Siemens-Albis Aktiengesellschaft. Apparatus for applying solder to the connections of integrated circuit components. 4,295,441, Cl. 118-425.000.

Foster, Arthur M.: *See*—
Tang, David Y.; and Foster, Arthur M., 4,296,244, Cl. 562-470.000.

Fountain, Frank S., to Du Pont de Nemours, E. I., and Company. Tension measuring apparatus. 4,295,360, Cl. 73-15.600.

Four Star Corporation: *See*—
Kowalski, Daniel J.; and Mareydt, Ray G., 4,295,588, Cl. 224-321.000.

Fourcadier, Chantal: *See*—
Grollier, Jean F.; Bugaut, Andree; Andrillon, Patrick; and Fourcadier, Chantal, 4,295,848, Cl. 8-421.000.

Fox, Bryce J., to Minnesota Mining and Manufacturing Company. Heat and liquid recovery using open cycle heat pump system. 4,295,282, Cl. 34-27.000.

Fox Valley Process Systems & Supply, Inc.: *See*—
Galloway, Tod R., 4,295,491, Cl. 137-625.460.

Foxcroft, Garth, to Brink, Dirk Marinus. Protective tire chain assembly. 4,295,510, Cl. 152-220.000.

Fram Industrial Filter Corp.: *See*—
Jain, Kamlesh K., 4,295,973, Cl. 210-738.000.

Franco, Wayne P. Method of treating the heart for myocardial infarction. 4,296,100, Cl. 424-108.000.

Frangatos, Gerassimos, to Mobil Oil Corporation. Sulfurized aminoguanidine reaction product and lubricant compositions containing same. 4,295,982, Cl. 252-42.000.

Franken, Adrianus J. J.; Khoe, Giok D.; and Kuppers, Dieter, to U.S. Philips Corporation. Method of producing microlenses. 4,296,143, Cl. 427-38.000.

Franks, Larry A.; and Nelson, Melvin A., to United States of America, Energy. Waveform synthesizer. 4,296,319, Cl. 250-227.000.

Frantello, Alfred A.; and Kefauver, Lester R., to Corinco, Inc. Balanced mower head for carrying a plurality of monofilament lines. 4,295,324, Cl. 56-12.700.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Riessberger, Klaus, 4,295,764, Cl. 409-296.000.

Fraser, David R., to United States of America, Health and Human Services. Washer for resin-coated photographic prints. 4,295,730, Cl. 354-325.000.

Frechet, Daniel: *See*—
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,296,126, Cl. 424-316.000.

Freeman Chemical Corporation: *See*—
Cordts, Howard P.; and Karloske, Joan E., 4,295,907, Cl. 156-246.000.

Frei, Willi. Process for the production of a tubular heat exchanger, and a tubular heat exchanger produced according to this process. 4,295,522, Cl. 165-79.000.

Freller, Walter: *See*—
Artweger, Wolfgang; and Freller, Walter, 4,295,679, Cl. 296-171.000.

Freundlinger, Ernst; and Hirschvogel, Alfred, to Sigri Elektrographit GmbH. Flexible graphite sheet, material or layer containing metal molybdate. 4,296,177, Cl. 428-408.000.

Frey, Gunter: *See*—
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Haaf, Friedhelm, 4,295,938, Cl. 202-248.000.

Frielinghaus, Rainer: *See*—
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.

Friese, Karl-Hermann, to Robert Bosch GmbH. Method to apply multiple layers, including an electrode layer, on a sintered or pre-sintered ion conductive solid electrolyte body. 4,296,148, Cl. 427-125.000.

Frijns, Leon H. B.: *See*—
Jongsma, Cornelis; Frijns, Leon H. B.; and Raven-Donners, Paula A. M., 4,296,245, Cl. 562-494.000.

Frontier Industries, Inc.: *See*—
Boswell, George T., 4,295,290, Cl. 46-74.00C.

Frost, George H. Combined lens cap and sunshade for a camera. 4,295,706, Cl. 350-58.000.

Frost, John W., to W. R. Grace & Co. Variable speed drive. 4,295,383, Cl. 474-83.000.

Fuher, Reginald S.: *See*—
Philpott, Arthur; and Fuher, Reginald S., 4,295,391, Cl. 74-782.000.

Fuji Photo Film Co., Ltd.: *See*—
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.
Oosaka, Shigenori; and Murakoshi, Makoto, 4,295,589, Cl. 226-122.000.
Yagihara, Morio; and Yokota, Yukio, 4,296,199, Cl. 430-551.000.
Yagihara, Morio; and Yokota, Yukio, 4,296,200, Cl. 430-551.000.

Fuji Photo Optical Co., Ltd.: *See*—
Numata, Saburo, 4,295,716, Cl. 354-30.000.

Fujii, Hiroshi: *See*—
Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, 4,295,455, Cl. 123-569.000.

Fujii, Shigeo: *See*—
Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, 4,295,809, Cl. 425-72.00S.

Fujimori, Ryo: *See*—
Fujiwara, Toshihide; and Fujimori, Ryo, 4,295,949, Cl. 204-180.00G.

Fujioka, Tadashi: *See*—
Nomura, Hirokazu; and Fujioka, Tadashi, 4,296,306, Cl. 219-124.340.

Fujitsu Fanuc Limited: *See*—
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,296,364, Cl. 318-572.000.
Imazeki, Ryoji; and Yamazaki, Etuo, 4,296,473, Cl. 364-520.000.

Fujiwara, Kunio: *See*—
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,295,869, Cl. 65-3.110.

Fujiwara, Masato: *See*—
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.

Fujiwara, Toshihide; and Fujimori, Ryo, to Olympus Optical Co., Ltd. Method for determining boundary points in electrophoresis. 4,295,949, Cl. 204-180.00G.

Fukatsu, Akihiro; and Tada, Isao, to Toshiba Corporation. Magnetron with cooling means. 4,296,355, Cl. 315-39.510.

Fukuda, Minoru: *See*—
Wada, Yoshimasa; Yamazaki, Sigeki; Kobayashi, Isamu; Haraguchi, Noriyuki; and Fukuda, Minoru, 4,295,780, Cl. 414-749.000.
Fukui, Masahisa: *See*—
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,296,309, Cl. 219-216.000.
Fukui, Osamu, to Takara Co., Ltd. Toy figure having repositionable head and limbs. 4,295,291, Cl. 46-161.000.
Fukui, Shosin; and Akazawa, Tadashi, to Daikin Kogyo Co., Ltd. Perfluoroalkyl-acr[methacr]ylate, hydroxy-chloropropyl-acrylate polymer. 4,296,224, Cl. 526-243.000.
Fukunaga, Yasushi: *See*—
Bandoh, Tadaaki; and Fukunaga, Yasushi, 4,296,468, Cl. 364-200.000.
Fukuyama, Hiroomi; and Isobe, Shinichi, to Fujitsu Fanuc Limited. Tool compensation system. 4,296,364, Cl. 318-572.000.
Fuller, Harrison W.; and Stromswold, Chester E., to Sanders Associates, Inc. Crimped coax reflective dispersive delay line. 4,296,389, Cl. 333-160.000.
Furukawa, Yoshimi: *See*—
Sano, Shoichi; and Furukawa, Yoshimi, 4,295,657, Cl. 280-91.000.
Furusawa, Kahei: *See*—
Nakai, Taiichiro; Furusawa, Kahei; and Ejiri, Yoshihiro, 4,295,707, Cl. 350-96.200.
Fuseya, Shigeaki; and Ichisaka, Teruo, to Chlorine Engineers Corp., Ltd. Filter press type ion exchange membrane-method electrolysis cell. 4,295,953, Cl. 204-257.000.
Futamura, Kenichiro: *See*—
Iwahana, Keiiti; Mathuda, Yoshimi; and Futamura, Kenichiro, 4,296,183, Cl. 428-653.000.
G. H. Products, Inc.: *See*—
Griffin, Kary A., 4,295,319, Cl. 52-785.000.
Gagliani, John; and Sorathia, Usman A. K., to International Harvester Company. Methods of preparing polyimides and polyimide precursors. 4,296,208, Cl. 521-77.000.
Gagnon, Peter R.: *See*—
Kimball, Stephen F.; and Gagnon, Peter R., 4,296,351, Cl. 313-222.000.
Gale, John A., to A.P.V. Spiro-Gills Limited. Water chilling plant. 4,295,341, Cl. 62-100.000.
Galloway, Tod R., to Fox Valley Process Systems & Supply, Inc. Double angled-disc diverter valve or the like. 4,295,491, Cl. 137-625.460.
Gambro Dialysatoren GmbH & Co. KG.: *See*—
Rosemeier, Friedrich; and Killmaier, Horst, 4,295,495, Cl. 138-89.000.
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, to Voest-Alpine Aktiengesellschaft; and Krautkraemer GmbH. Ultrasonic method of testing welded joints. 4,295,375, Cl. 73-582.000.
Garcia, Felix, Jr.; Hergert, Roger A.; Mann, Don C.; and Brown, Sheldon H., to Texas Instruments Incorporated. Recording cartridge having a flat smoothing plane with a raised portion. 4,296,448, Cl. 360-135.000.
Garman, Ronald H., to Caterpillar Tractor Co. Window clip retainer. 4,295,306, Cl. 52-208.000.
Garnache, Richard R.; and Kenney, Donald M., to International Business Machines Corporation. Method for providing self-aligned conductor in a V-groove device. 4,295,924, Cl. 156-643.000.
Garner, Robert: *See*—
Petitpierre, Jean C.; and Garner, Robert, 4,295,663, Cl. 282-27.500.
Garrison, Judd F., to John Thomas Batts, Inc. Multi-piece hanger. 4,295,585, Cl. 223-96.000.
Gascoyne, John M.: *See*—
Rowsell, David G.; Gascoyne, John M.; and Hems, Roger, 4,296,093, Cl. 424-45.000.
Gaspar, Randal. Jet sled spoil scoop apparatus. 4,295,757, Cl. 405-163.000.
Gass, John C.; Kerr, Noell C.; and Pittmann, Robert W., to Texaco Inc. Method for forming remotely actuated gas lift systems and balanced valve systems made thereby. 4,295,795, Cl. 417-111.000.
Gates, Allen P.: *See*—
Harper, Terence; and Gates, Allen P., 4,296,194, Cl. 430-176.000.
Gates Rubber Company, The: *See*—
Bixby, Guy T., 4,295,496, Cl. 138-122.000.
Gauchel, Peter; and Wissinger, Waldemar, to Dynamit Nobel Aktiengesellschaft. Process for the extrusion of coated skein-shaped profiles, preferably of thermoplastic synthetic resins. 4,296,062, Cl. 264-173.000.
Gauthier, Michel: *See*—
Poirier, Marc; Gauthier, Michel; and Belanger, Andre, 4,295,939, Cl. 204-1.00T.
Gavin, John H.: *See*—
Adams, John E.; Evans, Robert F.; and Gavin, John H., 4,295,254, Cl. 29-33.00M.
Gee, Charles E., deceased. Convertible sun shade. 4,295,481, Cl. 135-5.00R.
Gehrig, Heinz: *See*—
Knopp, Hans; Herion, Dieter; Conzelmann, Gerhard; and Gehrig, Heinz, 4,295,253, Cl. 28-255.000.
Gehrke, Gunter: *See*—
Duchardt, Karl H.; and Gehrke, Gunter, 4,296,044, Cl. 260-381.000.
Geisthoff, Hubert; and von Allwoerden, Wilhelm, to Jean Walterscheid GmbH. Adjustable length upper guide member. 4,295,389, Cl. 74-586.000.
Genco, Vito; and Turco, Vincenzo L., to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Plastic wads and wad assemblies for shot cartridges. 4,295,426, Cl. 102-451.000.
General Dynamics Corporation: *See*—
Couchman, James C., 4,295,377, Cl. 73-761.000.
General Electric Company: *See*—
Berlec, Ivan; and McCarty, Lewis V., 4,296,352, Cl. 313-315.000.
Eichelberger, Charles W.; Dehn, Rudolph A.; and Wojnarowski, Robert J., 4,296,296, Cl. 219-10.55B.
Eichelberger, Charles W., 4,296,449, Cl. 361-3.000.
Jenkins, Thomas E., 4,295,692, Cl. 312-228.000.
Kruszona, Edward G., 4,295,439, Cl. 118-317.000.
Milkovic, Miran, 4,296,413, Cl. 340-870.380.
Miller, Matthew S., 4,296,297, Cl. 219-10.55F.
Mirabella, Paul J., 4,296,329, Cl. 250-491.000.
Patenaude, Raymond A.; Duke, Steven R.; and Proulx, Edward A., 4,295,410, Cl. 89-12.000.
Pauze, Denis R.; and Zamek, Otto S., 4,296,229, Cl. 528-45.000.
Rabe, Jerry R., 4,296,344, Cl. 310-184.000.
Salem, Robert J., 4,296,312, Cl. 219-501.000.
Simcoe, Robert J., 4,296,335, Cl. 307-200.00B.
Steyer, William; and Duffy, Robert J., 4,295,332, Cl. 60-264.000.
Stottmann, Richard L.; and Smith, Peter H., 4,296,299, Cl. 219-10.810.
Wambach, Allen D., 4,296,021, Cl. 260-40.00R.
Wilkinson, Stanley B., 4,296,451, Cl. 361-80.000.
General Foods Corporation: *See*—
Lazarus, Charles R.; Stahl, Howard D.; and Haas, Gerhard J., 4,296,132, Cl. 426-2.000.
General Foods Inc.: *See*—
Millar, Donald B., 4,296,026, Cl. 260-123.500.
General Motors Corporation: *See*—
Brandt, Howard C.; and Grabowski, Leonard R., 4,295,384, Cl. 74-424.8NA.
Johnson, Jesse F., 4,295,791, Cl. 416-241.00B.
General Semiconductor Co., Inc.: *See*—
Skanadore, William R., 4,296,336, Cl. 307-300.000.
General Tire & Rubber Co.: *See*—
Roper, Ralph E., 4,295,357, Cl. 72-344.000.
Geosource Inc.: *See*—
Wendelboe, Fred E., 4,295,369, Cl. 73-261.000.
Gerard, Andre: *See*—
Lacombat, Michel; and Gerard, Andre, 4,295,735, Cl. 355-43.000.
Gerber, Howard L., to Continental Group, Inc., The. Progressive welding and forging of overlapped seams in tubular bodies. 4,296,293, Cl. 219-8.500.
Gerlach, Robert L., to Perkin-Elmer Corporation, The. Secondary emission mass spectrometer mechanism to be used with other instrumentation. 4,296,323, Cl. 250-289.000.
Gersi, Julius J.: *See*—
Griesenauer, Neal M.; and Gersi, Julius J., 4,296,178, Cl. 428-462.000.
Geurts, Martinus F. A. M., to U.S. Philips Corporation. Clamping circuit for a video signal. 4,296,437, Cl. 358-173.000.
Ghelardoni, Mario; Pestellini, Vittorio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, to A. Menarini S.A.S. Pharmaceutical methods. 4,296,124, Cl. 424-285.000.
Gibbs, Dale S., to Dow Chemical Co., The. Vinylidene chloride polymer microgels. 4,296,013, Cl. 260-29.6TA.
Gibbs, Ronald L., to Dow Chemical Company, The. Support prepared from organomagnesium compounds and silicon halides; and catalysts for polymerizing olefins. 4,295,992, Cl. 252-429.00C.
Gibson, Joseph T.; and Duhon, Gerald L., to A. C. Company. Drilling fluid circulating and monitoring system and method. 4,295,366, Cl. 73-155.000.
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Williams, Donald E.; Robertson, Forrest E.; Gigot, C. Dean; and Gigot, Terry K., 4,295,532, Cl. 172-184.000.
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Green, Milton, to United States of America, Navy. Pressure sensitive line transducer. 4,296,487, Cl. 367-169.000.
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Card, Lorin P.; and Borsting, Otto W., 4,295,630, Cl. 251-14.000.
Zahid, Abduz, 4,295,492, Cl. 138-30.000.
Gregory, Leslie A., to UOP Inc. Seat having lumbar support and vertical height adjustment mechanism therefor. 4,295,681, Cl. 297-284.000.
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Maya, Jakob, 4,296,350, Cl. 313-26.000.
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Gunn, Duncan A., to International Standard Electric Corporation. Electrical connector for submarine repeaters or the like. 4,295,701, Cl. 339-94.00A.
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Gutzwiller, Howard L., to Robinson Industries, Inc. Cover plates for tank heads. 4,295,789, Cl. 416-213.00A.
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Haberl, John B., to United States of America, Navy. Flexible loop slip ring brush. 4,296,345, Cl. 310-219.000.
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Hafer, Edward H., to Bell Telephone Laboratories, Incorporated. Continuity verification arrangement. 4,296,492, Cl. 370-14.000.
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Hansen, Roger M., to Stratabolt Corporation. Post tensionable grouted anchor assembly. 4,295,761, Cl. 405-261.000.

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Wada, Yoshimasa; Yamazaki, Sigeki; Kobayashi, Isamu; Haraguchi, Noriyuki; and Fukuda, Minoru, 4,295,780, Cl. 414-749.000.

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Haraszti, Tegzi P., to Rockwell International Corporation. Merged field effect transistor circuit and fabrication process. 4,296,428, Cl. 357-41.000.

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Caplin, Peter B.; and Harman, Maurice, 4,295,817, Cl. 431-7.000.

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Becker, Reinhold; Michel, Wolfgang; and Hartmann, Gerhard, 4,295,563, Cl. 206-205.000.

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Middlebrook, Robert E.; Harvey, George R.; and Chupp, John P., 4,296,254, Cl. 564-214.000.

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Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, 4,296,439, Cl. 358-257.000.

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Hayashi, Masaharu, to Aisin Seiki Kabushiki Kaisha. Viscous fluid coupling device. 4,295,550, Cl. 192-58.00B.

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Lustgarten, Stewart J., 4,295,941, Cl. 204-35.00R.

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Thunker, Norbert, 4,295,422, Cl. 101-232.000.

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Heinz, Theodore A., to Rockwell International Corporation. Deformable mirror with dither. 4,295,710, Cl. 350-310.000.

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Rogier, Edgar R., 4,296,004, Cl. 260-18.0EP.
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Ziche, Horst, 4,296,235, Cl. 536-85.000.
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Angel, Henry R.; and Hennessy, James W., 4,296,373, Cl. 324-71.0CP.
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Alderton, Gordon H. S., 4,295,770, Cl. 411-531.000.
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Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., to Tennant Company. Scrubbing machine with water regeneration. 4,295,244, Cl. 15-320.000.
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Bricher, Charles W.; and Herpers, Ferdinand J., 4,295,274, Cl. 30-347.000.
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Hieber, Udo: *See*—
Aigle, Karl; Hieber, Udo; Huebscher, Wilhelm; Rheindorf, Hans H.; and Wiedemann, Rolf, 4,296,453, Cl. 361-275.000.
Hiei, Shoki, to Toyooki Kogyo Kabushiki Kaisha. Lubricator. 4,295,545, Cl. 184-55.00A.
Higashi, Akio: *See*—
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.
Higgs, Jacob K.; and Avery, Grant D., to Sprague Electric Company. Two-state Hall element proximity sensor device with lamp indicator. 4,296,410, Cl. 340-686.000.
Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, to Nippon Steel Corporation. Method for coating one side only of steel strip with molten coating metal. 4,296,145, Cl. 427-47.000.
Hildebrandt, Eugene F.; and Ottersbach, Thomas V., to Emerson Electric Co. Motor starting switch. 4,296,366, Cl. 318-793.000.
Hildebrecht, Harold V., to Towmotor Corporation. Vehicle brake and engine interlock. 4,295,540, Cl. 180-271.000.
Hilker, Dennis C., to Honeywell Information Systems Inc. Calibration apparatus for CML circuit test unit. 4,295,359, Cl. 73-5.000.
Hill, Amos G., to Hesston Corporation. Chopping mechanism with remote shearbar adjuster. 4,295,616, Cl. 241-241.000.
Hill, Edward D. Ink transfer member. 4,296,172, Cl. 428-331.000.
Hill, Roy K., to Sperry Corporation. Sprocket hole sensing detector for moving translucent paper sheets. 4,296,332, Cl. 250-570.000.
Hinds, Virgil A. Crankless reciprocating engine and gyroscopic power transmission system. 4,295,381, Cl. 74-5.00R.
Hinkel, Lester H.; and Wolske, Lawrence E., to Whirlpool Corporation. Automatic hand washer and drier. 4,295,233, Cl. 4-619.000.
Hino, Masamichi: *See*—
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.
Hinrichs, Lansing M.: *See*—
Fahrig, Robert J.; and Hinrichs, Lansing M., 4,295,961, Cl. 208-161.000.
Hiraoka & Co., Ltd.: *See*—
Nakai, Shinzo; and Shimizu, Chitomi, 4,295,440, Cl. 118-412.000.
Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Speed control method for AC motors and an apparatus for the control. 4,296,367, Cl. 318-808.000.
Hiratsuka, Motoki: *See*—
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.
Hirayama, Tsutomu; and Hada, Hiroshi, to Nippon Electric Co., Ltd. Plasma display system. 4,296,357, Cl. 315-169.400.
Hirose, Chuji: *See*—
Yamaguchi, Takashi; Okuno, Yoshitoshi; and Hirose, Chuji, 4,295,581, Cl. 222-192.000.
Hirsch, Michael: *See*—
Diamond, George; Forrester, James; Hirsch, Michael; and Vas, Ran, 4,295,473, Cl. 178-695.000.
Hirschvogel, Alfred: *See*—
Freundlinger, Ernst; and Hirschvogel, Alfred, 4,296,177, Cl. 428-408.000.
Hitachi Chemical Company, Ltd.: *See*—
Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, 4,295,947, Cl. 204-159.150.
Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, 4,296,346, Cl. 310-242.000.
Takahashi, Akio; Itoh, Yutaka; Wajima, Motoyo; Morishita, Hirosada; and Nishikawa, Akio, 4,296,219, Cl. 525-488.000.
Hitachi Denshi Kabushiki Kaisha: *See*—
Achiha, Masahiko, 4,296,436, Cl. 358-167.000.
Hitachi Koki Company, Limited: *See*—
Kubota, Toshifumi, 4,295,272, Cl. 30-276.000.
Hitachi, Ltd.: *See*—
Achiha, Masahiko, 4,296,436, Cl. 358-167.000.
Bandoh, Tadaaki; and Fukunaga, Yasushi, 4,296,468, Cl. 364-200.000.
Hazama, Katashi; and Yuhara, Akitsuna, 4,296,391, Cl. 333-193.000.
Horiuchi, Masatada; and Katto, Hisao, 4,295,265, Cl. 29-571.000.
Imai, Kuninori; and Takahashi, Soji, 4,295,595, Cl. 228-161.000.
Ishikawa, Sakou; Watanabe, Yutaka; and Wakai, Katsuro, 4,296,494, Cl. 371-13.000.
Nakazima, Kooichi; Kazama, Keizo; and Oki, Hiroshi, 4,295,574, Cl. 220-2.10A.
Ogiwara, Kenzyu; Kawada, Minoru; and Ashida, Teiji, 4,295,781, Cl. 415-1.000.
Ohara, Ichiro, 4,295,748, Cl. 403-24.000.
Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, 4,296,346, Cl. 310-242.000.
Saito, Cyuichi; and Teranishi, Katsuya, 4,295,556, Cl. 198-325.000.
Sayo, Kosaku; Suginuma, Atsushi; Tatsumi, Hideo; and Kanamaru, Hisanobu, 4,295,553, Cl. 192-84.00C.
Tachibana, Keiji; Nakayama, Yoshihiko; Kaneko, Junichi; and Ishii, Susumu, 4,295,792, Cl. 417-15.000.
Takahashi, Akio; Itoh, Yutaka; Wajima, Motoyo; Morishita, Hirosada; and Nishikawa, Akio, 4,296,219, Cl. 525-488.000.
Tanaka, Hironari; Matsuyama, Shigeru; Ishibashi, Tadashi; Kinugawa, Kiyoshige; and Sato, Yukihiro, 4,295,711, Cl. 350-334.000.
Terao, Motoyasu; Shigematsu, Kazuo; Ojima, Masahiro; and Yonezawa, Seiji, 4,296,419, Cl. 346-135.100.
Hitachi Metals Precision, Ltd.: *See*—
Hatta, Masami; Iwata, Katsumi; and Sasaki, Masao, 4,295,444, Cl. 118-668.000.
Hitachi Service Engineering Co., Ltd.: *See*—
Ogiwara, Kenzyu; Kawada, Minoru; and Ashida, Teiji, 4,295,781, Cl. 415-1.000.
Ho, T. L.; and Din, Zia U., to SCM Corporation. Preparation of (−)-dihydrochrysanthemolactone. 4,296,038, Cl. 260-343.210.
Ho, T. L.; Din, Zia U.; and Cardenas, Carlos G., to SCM Corporation. Synthesis of (+)-cis-homocaronic acid. 4,296,251, Cl. 562-506.000.
Hochiki Corporation: *See*—
Sawa, Hiroshi, 4,295,371, Cl. 73-359.00A.
Hochstrasser geb. Wack, Elisabeth: *See*—
Mathieu, Hans; and Hochstrasser, Jurgen, 4,295,759, Cl. 405-243.000.
Hochstrasser, Jurgen: *See*—
Mathieu, Hans; and Hochstrasser, Jurgen, 4,295,759, Cl. 405-243.000.
Hodddinott, David C., to Crompton & Knowles Corporation. Ribbon cable extrusion crosshead. 4,295,812, Cl. 425-114.000.
Hodes, Gary; Cahen, David; and Manassen, Joost, to Yeda Research and Development Company Ltd. Cd(Se,Te) Alloy photovoltaic materials. 4,296,188, Cl. 429-111.000.
Hoechst Aktiengesellschaft: *See*—
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Konz, Elmar, 4,296,121, Cl. 424-275.000.
Becker, Reinhold; Michel, Wolfgang; and Hartmann, Gerhard, 4,295,563, Cl. 206-205.000.
Bergner, Dieter; Hannesen, Kurt; Muller, Wolfgang; and Schulte, Wilfried, 4,295,945, Cl. 204-128.000.
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,296,226, Cl. 526-316.000.
Faust, Raimund J., 4,296,196, Cl. 430-271.000.
Mayer, Manfred; and Volz, Roland, 4,295,937, Cl. 202-155.000.
Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; and Schmidt, Hans-Joachim, 4,296,266, Cl. 585-640.000.
Zimmermann, Wolfgang; Schindler, Hermann; and Pospich, Gunther, 4,296,210, Cl. 521-85.000.
Hoefke, Wolfgang: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.
Hofer, Bruce E., to Tektronix, Inc. Distortion reduction circuit for an inverting feedback amplifier. 4,296,381, Cl. 330-149.000.
Hoffman, Lawrence C., to Aerojet-General Corporation. Recirculating vapor system for gelling cryogenic liquids. 4,295,346, Cl. 62-500.000.
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, to Bayer Aktiengesellschaft. Preparation of 3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid derivatives. 4,296,241, Cl. 560-124.000.

Hoffmann-La Roche Inc.: *See—*
Fischli, Albert E.; and Szente, Andre, 4,296,031, Cl. 260-239.30D.
Hengartner, Urs, 4,296,259, Cl. 568-378.000.

Hogfeldt, Carl-Erik: *See—*
Nasman, John O.; and Hogfeldt, Carl-Erik, 4,296,067, Cl. 422-26.000.

Holland, Kenneth F., to Ygnacio Inc.; and Compact Video Systems Inc. High-resolution television system. 4,296,431, Cl. 358-12.000.

Holmberg, John M., to Boart International Limited. Thread structure for percussion drill elements. 4,295,751, Cl. 403-306.000.

Hologa, Zygmunt; Madeyski, Krystyn; and Kurowski, Adam, to Przedsiebiorstwo Montazu Elektrycznego "Elektrobudowa". Support assembly for high current bus bars. 4,296,273, Cl. 174-99.00B.

Holset Engineering Company Limited: *See—*
Vollett, Eric M., 4,295,546, Cl. 188-378.000.

Holstein und Kappert GmbH: *See—*
Heckmann, Werner, 4,295,558, Cl. 198-440.000.

Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, to Industrie-Wert Beteiligungsgesellschaft mbH. Filter for cleaning hot gases. 4,295,868, Cl. 55-302.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sano, Shoichi; and Furukawa, Yoshimi, 4,295,657, Cl. 280-91.000.

Honeywell, Inc.: *See—*
Schowe, Lester F., Jr., 4,296,445, Cl. 360-65.000.
Woods, Rodney G.; Clarke, Charles J., Jr.; and Sodergren, Robert C., 4,296,464, Cl. 364-200.000.

Honeywell Information Systems Inc.: *See—*
Hilker, Dennis C., 4,295,359, Cl. 73-5.000.
Lemak, Nicholas S., 4,296,465, Cl. 364-200.000.
Neuhoff, Donald; Mones, Arthur H.; and Lam, Man K., 4,295,271, Cl. 29-840.000.
Nibby, Chester M., Jr.; and Panepinto, William, Jr., 4,296,467, Cl. 364-200.000.

Hooker Chemicals & Plastics Corp.: *See—*
Bommaraju, Tilak V.; Dexter, Theodore H.; and Rader, Charles G., 4,295,951, Cl. 204-242.000.
Oppen, Dieter, 4,295,899, Cl. 148-6.160.
Tang, David Y.; and Foster, Arthur M., 4,296,244, Cl. 562-470.000.

Hoover, Merle V., to RCA Corporation. Class AB push-pull FET amplifiers. 4,296,382, Cl. 330-264.000.

Hope, Henry F.; and Hope, Stephen F. Apparatus for processing photographic materials. 4,295,590, Cl. 226-183.000.

Hope, Stephen F.: *See—*
Hope, Henry F.; and Hope, Stephen F., 4,295,590, Cl. 226-183.000.

Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, to Beiersdorf Aktiengesellschaft. Dental and mouth care preparations. 4,296,095, Cl. 424-52.000.

Horan, Douglas F., to Intel Corporation. Initializing circuit for MOS integrated circuits. 4,296,340, Cl. 307-550.000.

Horie, Takashi: *See—*
Satake, Toshihiko; Kono, Akira; Horie, Takashi; and Mitoma, Yasuharu, 4,295,420, Cl. 99-486.000.

Horiguchi, Makoto: *See—*
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, 4,296,182, Cl. 428-629.000.

Horiuchi, Masatada; and Katto, Hisao, to Hitachi, Ltd. Method for producing a nonvolatile semiconductor memory. 4,295,265, Cl. 29-571.000.

Hornbeck, Clarence J., to Follett Corporation. Load support structure. 4,295,309, Cl. 52-309.700.

Horner, John A.; and Wright, Dale W., to Horner, John A. Gear system and method of assembly. 4,296,313, Cl. 235-61.00L.

Horner, John W., Jr. Apparatus and method for recovering organic and non-ferrous metal products from shale and ore bearing rock. 4,295,880, Cl. 75-10.00R.

Hornle, Reinhold: *See—*
Nonn, Konrad; Wolf, Karlheinz; Haus, Artur; and Hornle, Reinhold, 4,295,849, Cl. 8-524.000.

Horsfall, Harry: *See—*
Ashfield, Herbert E.; Horsfall, Harry; and Wade, Philip M., 4,295,530, Cl. 172-7.000.

Horsfield, Arthur K.: *See—*
Minoprio, William E.; and Horsfield, Arthur K., 4,296,460, Cl. 362-200.000.

Hoshino, Masaru, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for sterilizing a succession of food containers or the like. 4,296,068, Cl. 422-62.000.

Hoshinouchi, Susumu: *See—*
Shimada, Wataru; Hoshinouchi, Susumu; Kawaguchi, Kenji; and Yoshida, Akio, 4,295,906, Cl. 156-214.000.

Hosmer/Dorrance Corporation: *See—*
Prout, Wesley C., 4,295,466, Cl. 128-80.00R.

Howie, Robert K., Jr., to Grigolei: Company, The. Knob. 4,295,246, Cl. 16-121.000.

Hoxan Co. Ltd.: *See—*
Kuraoka, Yasuo; and Tsuchida, Yasuhiro, 4,295,339, Cl. 62-64.000.

Hrehovcik, Michael: *See—*
Mann, Samuel J.; and Hrehovcik, Michael, 4,295,467, Cl. 128-303.180.

Hsiao, James C., to Union Special Corporation. Feed mechanism for sewing machines. 4,295,434, Cl. 112-314.000.

Hsu, Sheng T., to RCA Corporation. Method of manufacturing bulk CMOS integrated circuits. 4,295,266, Cl. 29-571.000.

Hubele, Adolf: *See—*
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,296,118, Cl. 424-273.00P.

Huber, Bernhard, to Bodenseewerk Perkin-Elmer & Co., GmbH. Apparatus and methods for sample enrichment for flameless atomic absorption spectroscopy. 4,295,854, Cl. 23-230.0PC.

Hubner, Kurt: *See—*
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, 4,295,868, Cl. 55-302.000.

Hudson, Robert L., to Chevron Research. Polypropylene blend compositions. 4,296,022, Cl. 260-42.460.

Huebscher, Wilhelm: *See—*
Aigle, Karl; Hieber, Udo; Huebscher, Wilhelm; Rheindorf, Hans H.; and Wiedemann, Rolf, 4,296,453, Cl. 361-275.000.

Hulek, Anton. Guard rail. 4,295,637, Cl. 256-13.100.

Hulke, Donald B. Hanging shelves. 4,295,432, Cl. 108-149.000.

Hull, Charles J.; Hutton, James E.; and Mahuson, Teri J., to Xerox Corporation. Bound document apparatus latching mechanism. 4,295,732, Cl. 355-14.00R.

Hurt, James J., to Deere & Company. Inspection system and apparatus therefor. 4,296,474, Cl. 364-560.000.

Hurt, Roger W.: *See—*
Schmid, Michael G.; and Hurt, Roger W., 4,295,577, Cl. 220-86.0AT.

Hutson, Maurice L., to Control Data Corporation. Register device for transmission of data having two data ranks one of which receives data only when the other is full. 4,296,477, Cl. 364-900.000.

Huttenhow, George H. Pivoted lever actuator. 4,295,385, Cl. 74-478.000.

Hutton, James E.: *See—*
Hull, Charles J.; Hutton, James E.; and Mahuson, Teri J., 4,295,732, Cl. 355-14.00R.

Hycel, Inc.: *See—*
Angel, Henry R.; and Hennessy, James W., 4,296,373, Cl. 324-71.0CP.

Hydril Company: *See—*
Mott, James D., 4,295,523, Cl. 166-250.000.

Hydro-Quebec: *See—*
Poirier, Marc; Gauthier, Michel; and Belanger, Andre, 4,295,939, Cl. 204-1.00T.

Ibberson, Robert B. Strip brick facing material. 4,296,154, Cl. 428-15.000.

Ichisaka, Teruo: *See—*
Fuseya, Shigeaki; and Ichisaka, Teruo, 4,295,953, Cl. 204-257.000.

ICI Americas Inc.: *See—*
Magrans, Juan J., Jr., 4,296,020, Cl. 260-37.00N.
Markiewitz, Kenneth H., 4,296,215, Cl. 525-28.000.
Sherburne, Edwin C., 4,295,977, Cl. 252-8.900.

ICI Australia Limited: *See—*
Fensom, Donald J., 4,295,878, Cl. 75-1.00T.

Idacon, Inc.: *See—*
Kirchner, Roy P., 4,296,152, Cl. 427-440.000.

Ideal Toy Corporation: *See—*
Cooper, Julius, 4,295,649, Cl. 273-86.00B.

Igawa, Takao: *See—*
Hasegawa, Haruo; Taniguchi, Hiroyoshi; and Igawa, Takao, 4,296,190, Cl. 430-57.000.

Igelbuscher, Heinrich: *See—*
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, 4,295,868, Cl. 55-302.000.

IHC Holland N.V.: *See—*
Brandwijk, Willem; and Dam, Herman, 4,295,286, Cl. 37-58.000.

Iida, Yoshihiko, to Toyo Kogyo Co., Ltd. Heated fuel intake system in automobile engine. 4,295,454, Cl. 123-556.000.

Ikeda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Optical assembly for use in copying machine. 4,295,736, Cl. 355-57.000.

Ikeda, Tokuzo: *See—*
Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, 4,295,809, Cl. 425-72.00S.

Ikegami, Shiro: *See—*
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,296,123, Cl. 424-287.000.

Illes, Janos: *See—*
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, 4,296,072, Cl. 422-254.000.

Illinois Tool Works Inc.: *See—*
Bjorklund, Lowell L.; Berg, Ramon A.; and Sygnator, Henry A., 4,295,351, Cl. 72-38.000.

Imai, Kuninori; and Takahashi, Soji, to Hitachi, Ltd. Method of producing magnetron anode. 4,295,595, Cl. 228-161.000.

Imai, Mitsuru, to Ricoh Co., Ltd. Transfer sheet suitable for electrophotographic pressure-fixing. 4,296,171, Cl. 428-323.000.

Imazeki, Ryoji; and Yamazaki, Etuo, to Fujitsu Fanuc Limited. Profile control system. 4,296,473, Cl. 364-520.000.

Impellizzeri, Julius S.: *See—*
Etzold, Roland; Impellizzeri, Julius S.; and Vaughan, Thomas W., 4,295,557, Cl. 198-382.000.

Imperial Chemical Industries Limited: *See—*
Buckley, Alan J.; and Singer, Michael, 4,295,887, Cl. 106-18.330.
Greenwood, Gillian M.; and Woodstock, Alan, 4,295,888, Cl. 106-21.000.
Stuart-Webb, John, 4,296,217, Cl. 525-390.000.

Ims, Dale R.: *See—*
Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.

INCA Limited: *See—*
Tutty, Geoffrey C., 4,295,662, Cl. 282-27.500.
Industrie Pirelli S.p.A.: *See—*
Manini, Silvio; and Pacciarini, Antonio, 4,295,774, Cl. 414-331.000.
Industrie-Wert Beteiligungsgesellschaft mbH: *See—*
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, 4,295,868, Cl. 55-302.000.
Ingard, Karl U.: *See—*
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,295,416, Cl. 98-33.00R.
Ingrain, Raymond A.; and Cohen, Jacques, to La Telemecanique Electrique. Manual electric switch with thermal release. 4,296,396, Cl. 337-66.000.
Innertsberger, Ernst; Sommer, Oswin; Bosch, Erhard; Muller, Johann; and Schiller, August, to Wacker-Chemie GmbH. Room temperature curable compositions. 4,296,228, Cl. 528-33.000.
Innes, Robert A.; and Kehl, William L., to Gulf Research & Development Company. Process for the manufacture of acrylonitrile. 4,296,046, Cl. 260-465.300.
Innovative Photograhic Enterprises, Inc.: *See—*
Stevie, Robert W., 4,296,197, Cl. 430-300.000.
Inoue, Atsunori: *See—*
Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, 4,296,216, Cl. 525-66.000.
Inoue, Nobuyoshi, to Copal Company Limited. Blade type focal plane shutter. 4,295,726, Cl. 354-246.000.
Institut International de Pathologie Cellulaire et Moleculaire: *See—*
Baurain, Roger M.; and Trouet, Andre B. L., 4,296,105, Cl. 424-180.000.
Intel Corporation: *See—*
Horan, Douglas F., 4,296,340, Cl. 307-550.000.
Interliz Anstalt: *See—*
Heeb, Adolf, 4,295,447, Cl. 122-136.00R.
International Business Machines Corp.: *See—*
Dalboussiere, Gerard; and Draper, Wilburn D., 4,296,463, Cl. 364-200.000.
Fairchild, Peter T.; and Leininger, Joel C., 4,296,470, Cl. 364-200.000.
Garnache, Richard R.; and Kenney, Donald M., 4,295,924, Cl. 156-643.000.
Hartmann, Kurt, 4,295,746, Cl. 400-119.000.
Janssen, Donovan M.; and Seaward, William S., 4,295,733, Cl. 355-14.0SH.
Leaycraft, Edgar C.; Oktay, Sevgin; and Ostergren, Carl D., 4,296,455, Cl. 361-383.000.
International Computers Limited: *See—*
Dodds, Robert J., 4,295,695, Cl. 339-17.00F.
International Flavors & Fragrances Inc.: *See—*
Boden, Richard M., 4,296,137, Cl. 426-534.000.
Boden, Richard M., 4,296,138, Cl. 426-534.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,295,978, Cl. 252-8.900.
International Harvester Company: *See—*
Gagliani, John; and Sorathia, Usman A. K., 4,296,208, Cl. 521-77.000.
International Standard Electric Corporation: *See—*
Gunn, Duncan A., 4,295,701, Cl. 339-94.00A.
International Telephone and Telegraph Corp.: *See—*
Leithem, Phyllis C., 4,295,929, Cl. 162-83.000.
Inverness International Corp.: *See—*
Mann, Samuel J.; and Hrehovcik, Michael, 4,295,467, Cl. 128-303.180.
Investment Rarities, Inc.: *See—*
Schweizer, Eduard H., 4,295,623, Cl. 248-456.000.
Isayama, Takuro: *See—*
Yamazaki, Hiroshi; and Isayama, Takuro, 4,296,418, Cl. 346-75.000.
Ishibashi, Tadashi: *See—*
Tanaka, Hironari; Matsuyama, Shigeru; Ishibashi, Tadashi; Kinugawa, Kiyoshige; and Sato, Yukihiro, 4,295,711, Cl. 350-334.000.
Ishida, Hiroshi: *See—*
Sasaki, Koichi; Sumida, Yasuji; and Ishida, Hiroshi, 4,295,731, Cl. 355-14.00R.
Ishida, Yukihito: *See—*
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,296,123, Cl. 424-287.000.
Ishihara, Takeshi; Goto, Daisaku; and Sugiura, Hitoshi, to NGK Insulators, Ltd. Rod-type synthetic resin insulator with overcoat and metal fittings. 4,296,276, Cl. 174-179.000.
Ishii, Shinzo: *See—*
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Ishii, Susumu: *See—*
Tachibana, Keiji; Nakayama, Yoshihiko; Kaneko, Junichi; and Ishii, Susumu, 4,295,792, Cl. 417-15.000.
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Suzuki, Hajime; and Iwano, Yoshimi, 4,295,499, Cl. 139-370.200.
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Natzke, Ronald C.; and Brown, Thomas R., 4,295,287, Cl. 37-103.000.
Shumaker, John F., 4,295,779, Cl. 414-685.000.
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Wason, Satish K., 4,296,000, Cl. 252-455.00R.
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Jacobson, Richard L.; and Lin, Timothy T., to Minnesota Mining and Manufacturing Company. Two-layered photoreceptor containing a selenium-tellurium layer and an arsenic-selenium over layer. 4,296,191, Cl. 430-57.000.
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Jean, Raymond W. Wallcoverings. 4,296,162, Cl. 428-213.000.
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Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., to Dow Chemical Company, The. Polyurethane backed carpet. 4,296,159, Cl. 428-95.000.
Jenkins, Thomas E., to General Electric Company. Dishwasher tub assembly. 4,295,692, Cl. 312-228.000.
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Jensen, David C. Modular building structure. 4,295,307, Cl. 52-236.100.
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Jerome, Jonathan A., to Atlantic Richfield Company. Information carrier having inter-track identification code information. 4,296,491, Cl. 369-59.000.
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Draggoo, Vaughn G., 4,296,388, Cl. 331-94.50L.
John, Frank T., to A-T-O Inc. Microminiature palladium oxide gas detector and method of making same. 4,296,399, Cl. 338-34.000.
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Garrison, Judd F., 4,295,585, Cl. 223-96.000.
John Wyeth & Brother Limited: *See*—
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Johne, Hans; Muller, Wolfgang; Jentzsch, Arndt; and Schumann, Gunter, to VEB Kombinat Polygraph "Werner Lamberz". Liquid distributing roller assembly for printing machines. 4,295,423, Cl. 101-349.000.
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Walser, Mackenzie, 4,296,127, Cl. 424-319.000.
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Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., to Philip Morris Incorporated. Cooling apparatus and method in a liquid cryogen treatment process. 4,295,337, Cl. 62-54.000.
Johnson, Jesse F., to General Motors Corporation. Scalloped ceramic turbine. 4,295,791, Cl. 416-241.00B.
Johnson, Larry K., to Lawrence Brothers, Inc. Bifold door hinge assembly. 4,295,514, Cl. 160-206.000.
Johnson, Lester E. Elevator control adaptor for handicapped users. 4,296,291, Cl. 200-331.000.
Johnson, Matthey & Co., Limited: *See*—
Whitehead, Paul, 4,296,086, Cl. 423-392.000.
Johnson, Richard N. Parametric energy converter. 4,295,334, Cl. 60-669.000.
Johnson, Romain H. Die forming method and machine. 4,296,301, Cl. 219-69.00M.
Johnston, David: *See*—
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Jones, Emrys H., Jr.; and Lauer, Stephen D., to Conoco Inc. Pressure seal for pumping instruments through drill rod. 4,295,536, Cl. 175-214.000.
Jongsma, Cornelis; Frijns, Leon H. B.; and Raven-Donners, Paula A. M., to Stamicarbon, B.V. Method for the preparation of a pure alkali metal benzoate and benzyl alcohol. 4,296,245, Cl. 562-494.000.
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Joy Manufacturing Company: *See*—
Grantmyre, Ian; and Miedema, Brent, 4,295,411, Cl. 91-165.000.
Jubin, John C., Jr.: *See*—
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Korfanta, Carl, 4,295,308, Cl. 52-296.000.
Kaarlela, William T. Material and method for securing boron filaments to each other and to a substrate and cutting tools therefrom. 4,295,885, Cl. 75-208.00R.
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Mishima, Toshio, 4,296,384, Cl. 331-78.000.
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Kadin, Saul B., to Pfizer Inc. (Carboxy-oxo-pyrrolidino)phenylalkenamides and esters thereof as SRS-A antagonists. 4,296,120, Cl. 424-274.000.
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Kaiser, Paul H.; Neuenschwander, Rudolf; and Norton, Henry J., to Scott Paper Company. Dry-formed nonwoven fabric. 4,296,161, Cl. 428-171.000.
Kakar, Sarwan K.; Kappler, Frank R.; and Cramer, John J., to Diversey Corporation, The. Antistatic natural and synthetic textile materials which have been treated with salts of orthophosphoric or polyphosphoric acid. 4,296,165, Cl. 428-264.000.
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Kamada, Minoru: *See*—
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Kamei, Takeji, to Nihon Automatic Machinery Mfg. Co., Ltd. Method for treating water containing wastes. 4,295,972, Cl. 210-710.000.
Kamimura, Toshio, to Teijin Seiki Company, Limited. Hydraulic actuator. 4,295,413, Cl. 92-5.00L.
Kamm, Lawrence J. Limit switch assembly manufacturing machine. 4,295,555, Cl. 192-139.000.
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Kane, Vinayak V., to Ortho Pharmaceutical Corporation. Total synthesis of the utero-evacuant substance d,l-zoapatanol. 4,296,035, Cl. 260-333.000.
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Kansai Paint Co., Ltd.: *See*—
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Hagglund, Erik H. M.; and Giler, Roger R., 4,296,311, Cl. 219-464.000.
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Karell, Manuel L. Educational toy. 4,295,832, Cl. 434-168.000.
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Cordts, Howard P.; and Karloske, Joan E., 4,295,907, Cl. 156-246.000.
Karlsson, Einar. Limbing and barking device. 4,295,507, Cl. 144-208.00B.
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Kashima, Mitsuhiro, to Kayaba Kogyo Kabushiki Kaisha. Front end shock absorbing appartus for wheeled vehicle. 4,295,658, Cl. 280-276.000.
Kaspari, William J. Non-invasive vascular waveform transducer and apparatus. 4,295,471, Cl. 128-675.000.
Kasper, Erich, to Licentia Patent-Verwaltungs-G.m.b.H. Method of manufacturing a semiconductor/glass composite material. 4,295,923, Cl. 156-630.000.
Kaspers, Helmut; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal agents, processes for their preparation and their use for combating fungi. 4,296,116, Cl. 424-272.000.
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Kaufmann, Kenneth M., to Pako Corporation. Automatic anti-oxidation replenisher control. 4,295,729, Cl. 354-324.000.
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Kawaguchi, Yasuyosi; Shimotake, Munetoshi; and Yamamoto, Fujio, to Bridgestone Tire Company Limited. Thick-cord lightweight tire body having an improved fatigue life. 4,295,512, Cl. 152-354.00R.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,295,402, Cl. 84-1.030.
Kawamoto, Hirohisa: *See*—
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Kashima, Mitsuhiro, 4,295,658, Cl. 280-276.000.
Kazama, Keizo: *See*—
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Kearny, Thomas J. Paint spray booth with water wash. 4,295,866, Cl. 55-228.000.
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Keeble, Joseph D. Surface projectile game with mallets and three-sided targets. 4,295,650, Cl. 273-118.00R.
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Keizer, Eugene O.; and Alphonse, Gerard A., to RCA Corporation. System for measuring stylus shoe length. 4,296,371, Cl. 324-61.00R.
Kelly, Robert J., to Reynolds and Reynolds Company, The. Roll fed shingling machine with predetermined numbering. 4,295,642, Cl. 270-53.000.
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Kemmner, Ulrich: *See*—
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Kerle, Edward J.; and Beaver, Terry R., to Owens-Corning Fiberglas Corporation. Wax-containing unsaturated polyester laminating composition with aromatic tertiary amine. 4,296,009, Cl. 260-28.50R.
Kern, Mark T.; and Cinzori, Robert J., to Santa Barbara Research Center. Dual spectrum infrared fire sensor. 4,296,324, Cl. 250-339.000.
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Killmeyer, Charles W., deceased; by Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., to PPG Industries, Inc. Method of producing a pultruded, fiber reinforced rod. 4,296,060, Cl. 264-137.000.
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Kim, Kwon S., to Star Manufacturing Company of Oklahoma. Prefabricated panel construction system. 4,295,304, Cl. 52-90.000.
Kimball, Stephen F.; and Gagnon, Peter R., to GTE Products Corporation. Tungsten halogen lamp having lead-in wire comprising tantalum alloy. 4,296,351, Cl. 313-222.000.
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King, Virginia B. Floor treating apparatus. 4,295,243, Cl. 15-320.000.
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Kirchner, Roy P., to Idacon, Inc. Method and composition for treating wood with pentachlorophenol. 4,296,152, Cl. 427-440.000.
Kistler, Manfred: *See*—
Purr, Horst; Kistler, Manfred; and Muller, Rolf, 4,295,913, Cl. 156-345.000.
Kitagawa, Masahiro, to Olympus Optical Company, Ltd. Camera with operation indicator for auto-strobo unit. 4,295,717, Cl. 354-33.000.
Kitagawa, Masahiro: *See*—
Mizokami, Kazunori; and Kitagawa, Masahiro, 4,295,720, Cl. 354-51.000.
Kitamura, Yoichi: *See*—
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, 4,296,182, Cl. 428-629.000.
Kitasato Kenkyusho: *See*—
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Kito, Kyoji: *See*—
Sasaki, Susumu; Kito, Kyoji; and Koide, Akio, 4,295,855, Cl. 23-230.00B.
Kiuchi, Mitsuyuki, to Matsushita Electric Industrial Co., Ltd. Induction heating coil. 4,296,295, Cl. 219-10.49R.
Kiyohara, Takehiko: *See*—
Takashi, Uchiyama; Tsunekawa, Tokuichi; and Kiyohara, Takehiko, 4,295,722, Cl. 354-146.000.
Klaeui, Heinrich: *See*—
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,295,517, Cl. 165-1.000.
Klebe, Wilmer A. Geodetic dome. 4,295,303, Cl. 52-81.000.
Klein, Philipp H.; Addamiano, Arrigo; and Allen, Roger, to United States of America, Navy. Luminescent hafnia composition. 4,295,989, Cl. 252-301.40F.
Kliklok Corporation: *See*—
Baker, Thomas R.; and Collura, Peter C., 4,295,839, Cl. 493-143.000.
Klippel, Friedrich: *See*—
Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, 4,295,846, Cl. 8-186.000.
Klockner-Humboldt-Deutz AG (Zweigniederlassung Fahr): *See*—
Maier, Martin; Purrer, Josef; and Clemens, Ronald, 4,295,323, Cl. 56-10.200.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Schleiermacher, Herbert, 4,295,457, Cl. 123-574.000.
Kluting, Bernd A.; and Zaverni, Vikram H., to Keiper U.S.A., Inc. Superfine tooth seat back adjuster. 4,295,682, Cl. 297-367.000.
Knapman, Reginald G.: *See*—
Haslop, John M.; Knapman, Reginald G.; and West, Michael A., 4,296,326, Cl. 250-372.000.
Knapp, Heinrich: *See*—
Lembke, Manfred; and Knapp, Heinrich, 4,295,452, Cl. 123-470.000.

Knapp, John F.: *See*—
Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.
Knippel, Willis H.; and Ferris, Ray, to Pullman Incorporated. Railway hopper car latch mechanism. 4,295,430, Cl. 105-308.00E.
Knobbe, Karl-Heinz: *See*—
Beckert, Alexander; and Knobbe, Karl-Heinz, 4,296,294, Cl. 219-10.410.
Knopp, Hans; Herion, Dieter; Conzelmann, Gerhard; and Gehrig, Heinz, to BASF Aktiengesellschaft. Process and apparatus for texturizing filament bundles. 4,295,253, Cl. 28-255.000.
Knudsen, Eric T., to Beecham Group Limited. Medicament container. 4,295,567, Cl. 206-534.000.
Kobatake, Shinzo: *See*—
Kasahara, Shizuka; Yamanishi, Kazuhiko; Hanada, Toshiro; Tokuda, Kuniaki; and Kobatake, Shinzo, 4,295,853, Cl. 23-230.00B.
Kobayashi, Isamu: *See*—
Wada, Yoshimasa; Yamazaki, Sigeki; Kobayashi, Isamu; Haraguchi, Noriyuki; and Fukuda, Minoru, 4,295,780, Cl. 414-749.000.
Kobayashi, Kengo: *See*—
Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, 4,295,947, Cl. 204-159.150.
Kodama, Mikio: *See*—
Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, 4,296,216, Cl. 525-66.000.
Koehring Company: *See*—
Nicholson, Robert D.; and Daniel, Alger T., 4,295,594, Cl. 228-160.000.
Koenen, Klaus: *See*—
Becker Friedbert; Steinkamp, Johann; and Koenen, Klaus, 4,296,400, Cl. 340-32.000.
Koenig, Robert H.; and D'Angelo, Victor, to Tapeswitch Corporation of America. Normally closed wafer switch. 4,296,283, Cl. 200-16.00D.
Kohler, Kranz, to Messerschmitt-Bolkow-Blohm GmbH. Array of solar cells. 4,296,270, Cl. 136-244.000.
Kohyama, Mitsuaki, to Toshiba Corporation. Developing apparatus for electrostatic copying machine. 4,295,443, Cl. 118-657.000.
Koide, Akio: *See*—
Sasaki, Susumu; Kito, Kyoji; and Koide, Akio, 4,295,855, Cl. 23-230.00B.
Kojima, Tadayoshi: *See*—
Shimamura, Tadao; and Kojima, Tadayoshi, 4,296,051, Cl. 264-118.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, 4,296,439, Cl. 358-257.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakai, Taiichiro; Furusawa, Kahei; and Ejiri, Yoshihiro, 4,295,707, Cl. 350-96.200.
Kokusan Denki Co., Ltd.: *See*—
Kubo, Masaaki, 4,296,368, Cl. 322-75.000.
Kolyada, Vladimir A.: *See*—
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; and Shamsha, Ljudmila F., 4,295,946, Cl. 204-149.000.
Komatsu, Michiyasu: *See*—
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,296,065, Cl. 264-325.000.
Kondo, Shinichi: *See*—
Umezawa, Hamao; Okami, Yoshiro; and Kondo, Shinichi, 4,296,106, Cl. 424-181.000.
Kongshaug, Gunnar, to Norsk Hydro a.s. Method for steam cleaning of compressors. 4,295,895, Cl. 134-22.00R.
Konishiroku Photo Industry Co., Ltd.: *See*—
Nakamura, Hiroya, 4,296,423, Cl. 346-160.000.
Kono, Akira: *See*—
Satake, Toshihiko; Kono, Akira; Horie, Takashi; and Mitoma, Yasuharu, 4,295,420, Cl. 99-486.000.
Konta, Yukio, to Tomy Kogyo Co., Inc. Pinball actuator and feed mechanism. 4,295,651, Cl. 273-121.00D.
Konz, Elmar: *See*—
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Konz, Elmar, 4,296,121, Cl. 424-275.000.
Kopenhaver, Robert, to Certain-teed Corporation. Apparatus for manufacturing roofing shingles having multiple ply-appearance. 4,295,445, Cl. 118-695.000.
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, to Boehringer Ingelheim GmbH. 1-Aryloxy-2-hydroxy-3-[(Benzimidazolinone-substituted alkyl)-amino]propanes and salts thereof. 4,296,117, Cl. 424-273.00B.
Korfanta, Carl, to K S L Corporation. Pole base assembly, bolt circle adaptor. 4,295,308, Cl. 52-296.000.
Koshida, Osamu: *See*—
Itoh, Koichi; Koshida, Osamu; and Nakayama, Katsuichi, 4,295,354, Cl. 72-225.000.
Koster, Siegfried. Multi-filter chamber aquarium filter. 4,295,965, Cl. 210-169.000.
Kowalski, Daniel J.; and Mareydt, Ray G., to Four Star Corporation. Slotted side rail and movable bracket for article carrier. 4,295,588, Cl. 224-321.000.
Kowalski, David J.: *See*—
Aitken, Thomas; Kowalski, David J.; and Srinivasan, K. G., 4,295,930, Cl. 162-158.000.
Kozin, Cynthia H.: *See*—
Buck, Gordon K.; and Kozin, Cynthia H., 4,295,363, Cl. 73-117.300.
Koziol, Konrad; and Wenk, Erich, to Conradty GmbH & Co. Metallelektroden KG. Process for preparing manganese oxide. 4,295,942, Cl. 204-96.000.
Krasse, Bo: *See*—
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Kraus, Roland. Paint application method and machine. 4,296,317, Cl. 250-215.000.
Krautkraemer GmbH: *See*—
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.
Krebs, Karl-Friedrich: *See*—
Halpaap, Herbert; and Krebs, Karl-Friedrich, 4,295,968, Cl. 210-198.300.
Krebs, Peter: *See*—
Wuthrich, Hans-Rudolf; Krebs, Peter; Spiegel, Hubert; and Eicher, Franz, 4,296,289, Cl. 200-148.00R.
Krejcir, Oldrich: *See*—
Pustka, Zdenek; and Krejcir, Oldrich, 4,295,635, Cl. 254-93.0HP.
Kritz, Jacob A., to Sperry Corporation. Parametric array Doppler sonar apparatus. 4,296,482, Cl. 367-91.000.
Krivonos, Vadim P.: *See*—
Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M., 4,296,305, Cl. 219-101.000.
Kroll, Harley E.: *See*—
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,295,244, Cl. 15-320.000.
Kruger, Hermann, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine with oil pump gear surrounding and driven by crankshaft. 4,295,807, Cl. 418-170.000.
Krupey, John, to American Home Products Corporation. Method of obtaining a lyophilized product. 4,295,280, Cl. 34-5.000.
Krupp-Koppers GmbH: *See*—
Waldhofer, Reinhard, 4,295,448, Cl. 122-164.000.
Kruszona, Edward G., to General Electric Company. Hand operated apparatus for applying a gasketing composition. 4,295,439, Cl. 118-317.000.
Kubo, Masaaki, to Kokusan Denki Co., Ltd. Internal combustion engine driven generator. 4,296,368, Cl. 322-75.000.
Kubota Ltd.: *See*—
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.
Kubota, Toshifumi, to Hitachi Koki Company, Limited. Vibration control for mowing machine. 4,295,272, Cl. 30-276.000.
Kuhr, Manfred: *See*—
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.
Kuipers, Peter, to Nordson Corporation. Tube forming shoe and methods of forming a flexible web into a tube. 4,295,322, Cl. 53-450.000.
Kulin, Ralph; and Stauber, Ronald C., to Baxter Travenol Laboratories, Inc. Solution container hanger. 4,295,619, Cl. 248-95.000.
Kulprathipanja, Santi, to UOP Inc. Cellulose acetate butyrate bound zeolite adsorbents. 4,295,994, Cl. 252-430.000.
Kumazawa, Kenichi: *See*—
Momiyama, Kikuo; and Kumazawa, Kenichi, 4,295,723, Cl. 354-155.000.
Kumm, Emerson L. Flat belt transmission with rotary actuator and integrated control system. 4,295,836, Cl. 474-51.000.
Kumura, Teruhiko: *See*—
Matsushima, Yoshio; Kumura, Teruhiko; Kawamura, Isamu; and Kawata, Terushige, 4,296,094, Cl. 424-49.000.
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, to Ciba-Geigy Corporation. Fungicidal 3-[N-(pyrazol-1-yl-acetyl)-N-(substituted phenyl)]-amino-tetrahydro-2-furanones. 4,296,118, Cl. 424-273.00P.
Kupchinsky, Igor I.: *See*—
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.
Kupf, Lubomir; Travnicek, Jiri; Adamek, Radomil; and Kyzlink, Josef, to Statni vyzkumny ustav materialu. Mold for the injection molding of objects of large dimension and complicated surfaces from plastic material. 4,295,628, Cl. 249-80.000.
Kuppers, Dieter: *See*—
Franken, Adrianus J. J.; Khoe, Giok D.; and Kuppers, Dieter, 4,296,143, Cl. 427-38.000.
Kuraoka, Yasuo; and Tsuchida, Yasuhiro, to Hoxan Co. Ltd. Cryostat system utilizing a liquefied gas. 4,295,339, Cl. 62-64.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Enomoto, Satoru; Asano, Kiro; and Tanaka, Hiromitsu, 4,296,233, Cl. 536-5.000.
Kuriki, Minoru: *See*—
Takeuchi, Minami; and Kuriki, Minoru, 4,296,427, Cl. 357-39.000.
Kurima, Akinori; Iwase, Yasuhiro; and Kimiwada, Tadao, to Chiyoda Kako Kensetsu Kabushiki Kaisha. Fluidized bed contact apparatus. 4,295,967, Cl. 210-189.000.
Kurosaki, Shiro: *See*—
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,295,869, Cl. 65-3.110.

Kurowski, Adam: *See*—
Hologa, Zygmunt; Madeyski, Krystyn; and Kurowski, Adam, 4,296,273, Cl. 174-99.00B.
Kusters, Norbert L.: *See*—
Moore, William J. M.; Kusters, Norbert L.; and So, Eddy, 4,296,369, Cl. 323-218.000.
Kusy, Robert P., to Du Pont de Nemours, E. I., and Company. Specimen grips for dynamic mechanical analyzer. 4,295,374, Cl. 73-579.000.
Kuzminski, Henry W., to RCA Corporation. Color picture tube having improved slit type shadow mask and method of making same. 4,296,189, Cl. 430-5.000.
Kyosan Denki Kabushiki Kaisha: *See*—
Mochizuki, Hiroshi; and Seki, Tokio, 4,295,414, Cl. 92-98.000.
Kyowa Chemical Industry Co., Ltd.: *See*—
Matsushima, Yoshio; Kumura, Teruhiko; Kawamura, Isamu; and Kawata, Terushige, 4,296,094, Cl. 424-49.000.
Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Kyzlink, Josef: *See*—
Kupf, Lubomir; Travnicek, Jiri; Adamek, Radomil; and Kyzlink, Josef, 4,295,628, Cl. 249-80.000.
L. Schuler GmbH: *See*—
Finsterwalder, Kurt; Philipp, Karl-Heinz; Riedisser, Gunter; and Voss, Wilfried, 4,295,399, Cl. 83-251.000.
La Telemecanique Electrique: *See*—
Ingrain, Raymond A.; and Cohen, Jacques, 4,296,396, Cl. 337-66.000.
Labonte, Paul D.: *See*—
Hasselmann, Detlev E. M.; and Labonte, Paul D., 4,295,505, Cl. 141-301.000.
Lacombat, Michel; and Gerard, Andre, to Thomson-CSF. Optical projection system having a photorepetition function. 4,295,735, Cl. 355-43.000.
Ladage, Cornelis A.; Van Linge, Douwe J.; and Van Riessen, Huibert A., to ACF Chemiefarma N.V. Pharmaceutical compositions and their use in the prophylaxis and/or treatment of certain diseases. 4,296,131, Cl. 424-347.000.
Lajh, Rajko, to Swiss Aluminium Ltd. Device and method for introducing gases into molten metal. 4,295,883, Cl. 75-68.00R.
Lalu, Jean-Pierre: *See*—
Bouvet, Pierre; and Lalu, Jean-Pierre, 4,296,034, Cl. 260-326.820.
Lam, Man K.: *See*—
Neuhoff, Donald; Mones, Arthur H.; and Lam, Man K., 4,295,271, Cl. 29-840.000.
Lamarche, Bernard: *See*—
Mialon, Jacques; and Lamarche, Bernard, 4,295,388, Cl. 74-579.00R.
Landay, David L.; and Wolf, Alvan H., to Brookfield Athletic Shoe Company, Inc. Roller skating shoe. 4,295,655, Cl. 280-11.200.
Lander, Lynn H.: *See*—
Sepulveda, Ralph R.; and Lander, Lynn H., 4,295,845, Cl. 8-139.100.
Lane, James E.: *See*—
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.
Lang, Ernst; and Niemeyer, Lutz, to BBC Brown, Boveri & Company Limited. High-voltage, blast-actuated power switch having field electrodes. 4,296,285, Cl. 200-61.080.
Lang-Ree, Nils, to NPI Corporation. Chain broiler doctor blade. 4,295,418, Cl. 99-355.000.
Lang, Stanley A., Jr.; and Murdock, Keith C., to American Cyanamid Company. Metal chelates of 1,4-bis(substituted-amino-5,8-dihydroxyanthraquinones. 4,296,030, Cl. 260-239.00A.
Lange, Karl H., to Balda-Werke. Battery conservation by control of the charging circuit for a built-in electronic flash. 4,295,719, Cl. 354-50.000.
Langer, Alfred: *See*—
Schaefer, Hans G.; and Langer, Alfred, 4,295,908, Cl. 156-251.000.
Langford, Frederic E., to Washington Logging Equipment, Inc. System for inhauling and outhauling lines. 4,295,636, Cl. 254-304.000.
Langhammer, Jerome, to Poulson, Larry. Confined air food heating apparatus. 4,295,419, Cl. 99-427.000.
LaPrade, Steve A.; and Pallo, John M., to Johns-Manville Corporation. Thermal insulation especially for pipe, flanges and fittings. 4,295,669, Cl. 285-47.000.
Lardellier, Alain M. J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Removable sealing gasket for distributor segments of a jet engine. 4,295,785, Cl. 415-174.000.
Lardellier, Alain M. J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Removable support for the sealing lining of the casing of jet engine blowers. 4,295,787, Cl. 415-197.000.
Large, Eddie A. J. Resilient mounting for a reclining seat. 4,295,626, Cl. 248-575.000.
Larson, Clifford L., to Baldwin-Korthe Web Controls, Inc. Web severing device. 4,295,400, Cl. 83-545.000.
Larsson, Kare: *See*—
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Laso, Felipe. Method of combating amebiasis in humans. 4,296,102, Cl. 424-130.000.
Laso, Felipe. Stabilized solution of chlorine oxides. 4,296,103, Cl. 424-130.000.
Lattuada, Sergio, to S.T.I. Strumentazione Industriale S.p.A. Method for automating and optimizing the operative cycle in adsorption dehydration plants. 4,295,863, Cl. 55-21.000.
Lauer, Stephen D.: *See*—
Jones, Emrys H., Jr.; and Lauer, Stephen D., 4,295,536, Cl. 175-214.000.
Laurent, Henry; Esperling, Peter; Kapp, Joachim-Friedrich; and Wiechert, Rudolf, to Schering, Aktiengesellschaft. Corticoid 21-sulfopropionates and the salts thereof, a process for the production thereof and pharmaceutical preparations thereof. 4,296,109, Cl. 424-241.000.
Lawless, William N., to Lawless, William Nicholas. Thallous halide materials for use in cryogenic applications. 4,296,147, Cl. 427-120.000.
Lawless, William Nicholas: *See*—
Lawless, William N., 4,296,147, Cl. 427-120.000.
Lawrence Brothers, Inc.: *See*—
Johnson, Larry K., 4,295,514, Cl. 160-206.000.
Lazarus, Charles R.; Stahl, Howard D.; and Haas, Gerhard J., to General Foods Corporation. Dog food of improved acceptability. 4,296,132, Cl. 426-2.000.
Leaycraft, Edgar C.; Oktay, Sevgin; and Ostergren, Carl D., to International Business Machines Corporation. Slotted heat sinks for high powered air cooled modules. 4,296,455, Cl. 361-383.000.
Lebetzki, Egon: *See*—
Schneider, Hartmut; and Lebetzki, Egon, 4,295,870, Cl. 65-3.120.
LeBlanc, Ralph W.; and Bingham, Robert M. Apparatus for removing contaminants from lubricating oil. 4,295,966, Cl. 210-180.000.
Lebost, Barry A. Fluid turbine. 4,295,783, Cl. 415-2.00R.
LeClou, Andre, to Commissariat a l'Energie Atomique. Device for anchoring a vessel in a horizontal foundation raft. 4,295,620, Cl. 248-154.000.
Lee, Man S., to GTE Automatic Electric Laboratories, Inc. Switched capacitor bilinear resistors. 4,296,392, Cl. 333-213.000.
Lee, Ronald B.: *See*—
d'Hautecourt, Alain H.; Bretl, Wayne E.; and Lee, Ronald B., 4,296,435, Cl. 358-166.000.
Lee, Weng Y.; and Sehon, Alec. Suppression of reaginic antibodies to drugs employing polyvinyl alcohol as carrier therefor. 4,296,097, Cl. 424-78.000.
Lefort, Emmanuel: *See*—
Jeandot, Jean-Louis; and Lefort, Emmanuel, 4,296,383, Cl. 330-301.000.
Leggett & Platt, Incorporated: *See*—
Wells, Thomas J., 4,295,639, Cl. 267-91.000.
Whitehead, Larry W., 4,295,234, Cl. 5-184.000.
Leininger, Joel C.: *See*—
Fairchild, Peter T.; and Leininger, Joel C., 4,296,470, Cl. 364-200.000.
Leithem, Phyllis C., to International Telephone and Telegraph Corp. Process for acid sulfite digestion of wood. 4,295,929, Cl. 162-83.000.
Lemak, Nicholas S., to Honeywell Information Systems Inc. Data mover. 4,296,465, Cl. 364-200.000.
Lembke, Manfred; and Knapp, Heinrich, to Robert Bosch GmbH. Fuel injection system. 4,295,452, Cl. 123-470.000.
Leney, Thomas F.: *See*—
Pelton, Frank M.; Miller, Clyde A.; and Leney, Thomas F., 4,296,415, Cl. 343-16.00M.
Lennon, Donald J. J.; Hagerstrom, John R.; and Ekman, C. Frederick W., to EPP Corp. Inks for pulsed electrical printing. 4,296,176, Cl. 428-407.000.
Lenzi, Giuliano: *See*—
Toti, Gabriele; Lenzi, Giuliano; and Monti, Paolo, 4,295,660, Cl. 280-714.000.
Leonard, Verna M. Keyboard simulation with vertical inversion indexes. 4,295,407, Cl. 84-471.00R.
Lerch, John A., to Vulcan Iron Works Inc. Retaining assembly. 4,295,752, Cl. 403-317.000.
Lerch, Ulrich: *See*—
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Konz, Elmar, 4,296,121, Cl. 424-275.000.
Leslie, Wayne B. Speed indicating device. 4,295,367, Cl. 73-184.000.
Leupold, Ernst I.: *See*—
Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; and Schmidt, Hans-Joachim, 4,296,266, Cl. 585-640.000.
Lever Brothers Company: *See*—
Mindt, Lothar F. O., deceased; Payne, Peter R., administrator; and Sanderson, George R., 4,296,234, Cl. 536-47.000.
Sepulveda, Ralph R.; and Lander, Lynn H., 4,295,845, Cl. 8-139.100.
Levine, Irving. Apparatus for molding strand-mounted plastic members. 4,295,813, Cl. 425-121.000.
Lewis, John A., to Racal Recorders, Ltd. Magnetic recording and reproduction. 4,296,447, Cl. 360-113.000.
Lewis, Richard B.: *See*—
Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.
Lewis, Robert J., to Phillips Petroleum Company. Method for producing carbon black. 4,296,087, Cl. 423-449.000.
Lewis, Terry W., to Minnesota Mining and Manufacturing Company. Information carrying discs. 4,296,158, Cl. 428-65.000.
Lewus, Alexander J. Auxiliary power system for automotive vehicle. 4,295,538, Cl. 180-165.000.
Lex, Franz. Cleaning device. 4,295,240, Cl. 15-22.00R.
Leybold-Heraeus GmbH: *See*—
Beinitz, Karl; and Schubert, Joachim, 4,296,356, Cl. 315-135.000.

Wechsung, Reiner, 4,296,322, Cl. 250-282.000.
Leybold-Heraeus GmbH & Co. KG: *See*—
Stephan, Herbert; Aichert, Hans; and Heimerl, Joseph, 4,295,808, Cl. 425-8.000.
Liberman, Salomon: *See*—
Eriksson, Leif; and Liberman, Salomon, 4,296,452, Cl. 361-82.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Kasper, Erich, 4,295,923, Cl. 156-630.000.
Licht, Lazar, to United Technologies Corporation. Adjustable clearance foil journal bearing and method of manufacturing foil element therefor. 4,295,689, Cl. 308-9.000.
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Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M. Machine for continuous flash butt welding. 4,296,305, Cl. 219-101.000.
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Lindgren, Hazelle C. Brassiere construction. 4,295,469, Cl. 128-480.000.
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Haill, Harry K., 4,296,483, Cl. 367-13.000.
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Liu, Morris. Inflatable tent. 4,295,302, Cl. 52-2.000.
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Lochner, Kaspar. Paste-like, viscous damping medium comprising polyglycol ethers and/or esters. 4,295,984, Cl. 252-62.000.
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Baccei, Louis J., 4,295,909, Cl. 156-307.300.
Lollert, Bernd; and Risse, Heinrich, to Jagenberg-Werke AG. Irregular-motion mechanism. 4,295,382, Cl. 74-68.000.
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Grollier, Jean F.; Bugaut, Andree; Andrillon, Patrick; and Fourcadier, Chantal, 4,295,848, Cl. 8-421.000.
Lott, Donald L., to Siemens-Allis, Inc. Flexible shield for high voltage disconnect switch. 4,296,284, Cl. 200-48.00R.
Louthan, Jean H.; Cox, Russell C.; and Crawford, William V., to Phillips Petroleum Company. Adapter for connecting plastic pipe system to cast iron pipe system. 4,295,668, Cl. 285-21.000.
Lovell, John A.; and McIntosh, Kenneth W., to Goodyear Tire & Rubber Company, The. Tire and method of reinforcement. 4,295,513, Cl. 152-358.000.
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Archer, Michael A., 4,296,361, Cl. 318-54.000.
Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., 4,295,453, Cl. 123-499.000.
Young, Donald A.; and Squires, Christopher P., 4,296,342, Cl. 310-77.000.
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Luebke, Clement J.; Mitchell, John A.; and Daniels, Lowell W., to Alco Standard Corporation. Cooking device with water detecting means. 4,296,310, Cl. 219-440.000.
Luerken, Adolf; and Vogel, William D., to McCulloch Corporation. Torque transmitting apparatus. 4,295,753, Cl. 403-365.000.
Luers, George A., to Corning Glass Works. Producing a multi-color image in polychromatic glass. 4,295,872, Cl. 65-30.110.
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Lundstrom, Sten, to Aktiebolaget SKF. Nail press. 4,295,591, Cl. 227-142.000.
Lustgarten, Stewart J., to Healthco Inc. Method of manufacturing a metal ceramic dental restoration. 4,295,941, Cl. 204-35.00R.
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Abendroth, Paul; and Dettinger, Dietrich, 4,295,421, Cl. 101-216.000.
Maby, Edward W.; Kawamoto, Hirohisa; and Valembois, Pierre V., to RCA Corporation. Ion implanted stylus. 4,296,144, Cl. 427-38.000.
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White, Michael L., 4,295,362, Cl. 73-104.000.
Magrans, Juan J., Jr., to ICI Americas Inc. Polyurea thickened molding compositions. 4,296,020, Cl. 260-37.00N.
Mahl, Gunard O. B., to CHA Industries. Vacuum chamber door assembly and method. 4,296,153, Cl. 427-444.000.
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Maier, Martin; Purrer, Josef; and Clemens, Ronald, to Klockner-Humboldt-Deutz AG (Zweigniederlassung Fahr). Towed crop harvester. 4,295,323, Cl. 56-10.200.
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Malcom, George E. Combination hinge and overcenter closure for a door. 4,295,245, Cl. 16-80.000.
Malecha, Richard J., to Towmotor Corporation. Apparatus for supporting loads. 4,295,541, Cl. 180-315.000.
Mallory, Henry R.; and Nichols, Steven J., to Duracell International Inc. Battery package with DC to DC converter. 4,296,461, Cl. 363-22.000.
Malmgren, Nils-Gunnar; Solly, Barry; and Tarnblom, Stig, to Fagersta AB. Rolled wire having a fine-grain structure. 4,295,900, Cl. 148-12.00B.
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Mann, Samuel J.; and Hrehovcik, Michael, to Inverness International Corp. Electrolysis apparatus with retractable probe. 4,295,467, Cl. 128-303.180.
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Mapes, Charles W.; and Snyder, Richard H., to Brunswick Corporation. High speed outboard drive unit. 4,295,835, Cl. 440-78.000.
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Maresca, Louis M.; Gill, Peter J.; and Berger, Mitchell H., to Union Carbide Corporation. Process for preparing polyarylates in the presence of a diphenyl ether compound and a catalyst. 4,296,232, Cl. 528-179.000.
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Markham, Roger G.; and Skinner, Doyle P., Jr., to Xerox Corporation. Ink jet method and apparatus using a thin film piezoelectric excitor for drop generation with spherical and cylindrical fluid chambers. 4,296,417, Cl. 346-75.000.
Markiewitz, Kenneth H., to ICI Americas Inc. Method to thicken dissolved thermoset resins. 4,296,215, Cl. 525-28.000.
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Wurtman, Richard J., 4,296,119, Cl. 424-274.000.
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Forlenza, Nicholas G., 4,296,160, Cl. 428-117.000.
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Purr, Horst; Kistler, Manfred; and Muller, Rolf, 4,295,913, Cl. 156-345.000.
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Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, to Toyo Seikan Kaisha Limited. Can composed of electrolytically chromated steel. 4,296,182, Cl. 428-629.000.
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Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, 4,295,889, Cl. 106-22.000.
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Matsui, Kazuma: *See*—
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Matthews, James. Combination carpet razor knife and guide. 4,295,273, Cl. 30-293.000.
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Sokoly, Theodore O.; and Niedzialkowski, John, 4,296,002, Cl. 252-518.000.
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McMullen, Harold F. Valance support. 4,295,482, Cl. 135-8.000.
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Halpaap, Herbert; and Krebs, Karl-Friedrich, 4,295,968, Cl. 210-198.300.
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Rudolph, Paul; and Becker, Paul D., 4,295,864, Cl. 55-40.000.
Metrailer, William J., to Exxon Research & Engineering Co. Fluid coking process. 4,295,956, Cl. 208-127.000.
Metzger, Harold L. Flexible garbage can lid. 4,295,508, Cl. 150-52.00R.
Meyer, Burton C.: *See—*
Rosenwinkel, Donald A.; Meyer, Burton C.; and Disko, Harry, 4,295,294, Cl. 46-205.000.
Meyer, Stephen T., to Deflecto Corporation. File folder support rack. 4,295,571, Cl. 211-200.000.
Meyers, Edward: *See—*
Weisenborn, Frank L.; Brown, William E.; and Meyers, Edward, 4,296,101, Cl. 424-119.000.
Meyers, Frank. Reel mountable boom arrangement. 4,295,755, Cl. 405-66.000.
Mezzanotte, Mario; and Turchetti, Gianni, to Societa Pneumatici Pirelli S.p.A. Radial tires provided with a stiffening structure in the sidewalls. 4,295,511, Cl. 152-354.00R.
Mezzetti, Sergio; Pizzolati, Pierluigi; and Svelto, Francesco, to C.I.S.E. Centro Informazioni Studi Esperienze S.p.A. Opto-electronic instrument for remote temperature measurement. 4,296,318, Cl. 250-225.000.
Mialon, Jacques; and Lamarche, Bernard, to Societe Nationale Industrielle Aerospatiale. Control rod and a process for fitting a connecting member at one end of a control rod. 4,295,388, Cl. 74-579.00R.
Michel, Wolfgang: *See—*
Becker, Reinhold; Michel, Wolfgang; and Hartmann, Gerhard, 4,295,563, Cl. 206-205.000.
Michne, William F., to Sterling Drug Inc. 2,6-Methano-3-benzazocines. 4,296,238, Cl. 546-97.000.
Middlebrook, Robert E.; Harvey, George R.; and Chupp, John P., to Monsanto Company. Transetherification in amides. 4,296,254, Cl. 564-214.000.
Miedema, Brent: *See—*
Grantmyre, Innes; and Miedema, Brent, 4,295,411, Cl. 91-165.000.
Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, to Toa Nenryo Kogyo Kabushiki Kaisha. Die for a melt blowing process. 4,295,809, Cl. 425-72.00S.
Milana, Emilio; and Rasello, Franco, to Centro Ricerche Fiat S.p.A. Method and apparatus for detecting surface defects in a workpiece. 4,296,333, Cl. 250-572.000.
Milkovic, Miran, to General Electric Company. Resistance-bridge to frequency converter with automatic offset correction. 4,296,413, Cl. 340-870.380.
Millar, Donald B., to General Foods Inc. Production of soybean protein isolate of improved purity. 4,296,026, Cl. 260-123.500.
Miller, Clyde A.: *See—*
Pelton, Frank M.; Miller, Clyde A.; and Leney, Thomas F., 4,296,415, Cl. 343-16.00M.
Miller, Fred J., to Arthur Fulmer of Mississippi, Inc. Hanger assembly for merchandise. 4,295,564, Cl. 206-279.000.
Miller, Matthew S., to General Electric Company. Drive arrangement for microwave oven mode stirrer. 4,296,297, Cl. 219-10.55F.
Miller, Samuel, to Victoreen, Inc. Automatic gain control for radiation analyzer. 4,296,320, Cl. 250-252.000.
Miller, Terry A., to Phillips Petroleum Company. Data display system. 4,296,484, Cl. 367-71.000.
Miller, Theodore H., to Emhart Industries, Inc. Vertical rod exit device. 4,295,673, Cl. 292-21.000.
Miller, Wendell D.: *See—*
Erb, Tom L.; and Miller, Wendell D., 4,295,378, Cl. 73-861.250.
Miller, William J.: *See—*
McAleer, William J.; and Miller, William J., 4,296,024, Cl. 260-112.00B.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co. Programmable digital frequency divider for synthesizing signals at desired frequency. 4,296,380, Cl. 328-48.000.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co. Digital frequency synthesizer with frequency divider programmable in response to stored digital control signal. 4,296,407, Cl. 340-347.0CC.
Mindt, Lothar F. O., deceased; by Payne, Peter R., administrator; and Sanderson, George R., to Lever Brothers Company. Absorbent materials. 4,296,234, Cl. 536-47.000.
Miner, Jay G.: *See—*
Mayer, Steven T.; Miner, Jay G.; Neubauer, Douglas G.; and Decuir, Joseph C., 4,296,476, Cl. 364-900.000.
Mineura, Kazuyuki: *See—*
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Minneapolis Electric Steel Castings Company: *See—*
Mishek, James E., 4,295,615, Cl. 241-182.000.
Minnesota Mining and Manufacturing Company: *See—*
Fox, Bryce J., 4,295,282, Cl. 34-27.000.
Jacobson, Richard L.; and Lin, Timothy T., 4,296,191, Cl. 430-57.000.
Lewis, Terry W., 4,296,158, Cl. 428-65.000.
Schmit, Paul F., 4,295,904, Cl. 156-69.000.
Minolta Camera Kabushiki Kaisha: *See—*
Ikeda, Hiroshi, 4,295,736, Cl. 355-57.000.
Myochin, Hisashi, 4,295,239, Cl. 15-1.50R.
Sahara, Masayoshi; and Nakai, Masaaki, 4,295,724, Cl. 354-238.000.
Minoprio, William E.; and Horsfield, Arthur K., to Dorman Smith Traffic Products Limited. Lamps. 4,296,460, Cl. 362-200.000.
Minshall, Michael W.: *See—*
Lowe, Edward J.; Minshall, Michael W.; and Wilson, Arthur, 4,296,082, Cl. 423-305.000.
Mirabella, Paul J., to General Electric Company. Alignment device for computerized tomography phantoms. 4,296,329, Cl. 250-491.000.
Mishek, James E., to Minneapolis Electric Steel Castings Company. Shell liner assembly for ore comminuting machine. 4,295,615, Cl. 241-182.000.
Mishima, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho. Noise generator. 4,296,384, Cl. 331-78.000.
Mita Industrial Company Limited: *See—*
Sasaki, Koichi; Sumida, Yasuji; and Ishida, Hiroshi, 4,295,731, Cl. 355-14.00R.
Mitchell, Hal D., to A-T-O Inc. Shoulder pad. 4,295,227, Cl. 2-2.000.
Mitchell, John A.: *See—*
Luebke, Clement J.; Mitchell, John A.; and Daniels, Lowell W., 4,296,310, Cl. 219-440.000.
Mitchell, Thomas O., to Mobil Oil Corporation. Coal conversion catalysts. 4,295,954, Cl. 208-10.000.
Mitco Corporation: *See—*
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,295,416, Cl. 98-33.00R.

Mitoma, Yasuharu: *See*—
Satake, Toshihiko; Kono, Akira; Horie, Takashi; and Mitoma, Yasuharu, 4,295,420, Cl. 99-486.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Sendo, Masaaki; and Suzuki, Kinzo, 4,296,063, Cl. 264-273.000.
Shimada, Wataru; Hoshinouchi, Susumu; Kawaguchi, Kenji; and Yoshida, Akio, 4,295,906, Cl. 156-214.000.
Tanaka, Naoki; Tsuchiya, Kunihiko; and Nishizawa, Toshizo, 4,295,806, Cl. 418-97.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Otomaru, Tadao, 4,295,843, Cl. 493-354.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Kamada, Kazumasa; Nakai, Yoshio; and Abe, Kazunori, 4,296,214, Cl. 525-2.000.

Mitsui Engineering and Shipbuilding Co., Ltd.: *See*—
Yashima, Nobuyoshi, 4,295,758, Cl. 405-201.000.

Mitsui, Hiromitsu, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,296,489, Cl. 368-205.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Matsubara, Akira; Sakai, Hideaki; Odate, Makoto; Suganuma, Toshio; and Nakano, Takuo, 4,296,112, Cl. 424-246.000.

Miyagawa, Kiyoshi: *See*—
Sugata, Yoshiaki; and Miyagawa, Kiyoshi, 4,295,398, Cl. 82-31.000.

Miyashita, Kiyoshi: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,295,734, Cl. 355-15.000.

Miyazaki, Toshikuni: *See*—
Nomura, Etsuji; Matsui, Kazuma; Miyazaki, Toshikuni; Sami, Hiroshi; and Ueda, Tatehito, 4,295,456, Cl. 123-569.000.

Mizoguchi, Hitoshi: *See*—
Yanabu, Satoru; Mizoguchi, Hitoshi; and Simogawara, Naoaki, 4,296,288, Cl. 200-146.00R.

Mizokami, Kazunori, to Olympus Optical Company Ltd. Exposure control circuit of camera. 4,295,718, Cl. 354-50.000.

Mizokami, Kazunori; and Kitagawa, Masahiro, to Olympus Optical Company Ltd. Apparatus for determining light reflection from a focal plane shutter. 4,295,720, Cl. 354-51.000.

Mobil Oil Corporation: *See*—
Bowden, Edgard A., 4,296,442, Cl. 360-6.000.
Frangatos, Gerassimos, 4,295,982, Cl. 252-42.000.
Mitchell, Thomas O., 4,295,954, Cl. 208-10.000.
Rollmann, Louis D., 4,296,083, Cl. 423-329.000.
Yan, Tsoung-yuan, 4,296,075, Cl. 423-7.000.

Mochizuki, Hiroshi; and Seki, Tokio, to Kyosan Denki Kabushiki Kaisha. Diaphragm-type fuel pump. 4,295,414, Cl. 92-98.000.

Mock, George W., Jr.; and Mock, George W., Sr. Automatic flare signal apparatus. 4,295,437, Cl. 116-202.000.

Mock, George W., Sr.: *See*—
Mock, George W., Jr.; and Mock, George W., Sr., 4,295,437, Cl. 116-202.000.

Modica, Giovanni: *See*—
de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, 4,295,952, Cl. 204-252.000.

Moffatt, E. Marston, to United Technologies Corporation. Fluidic angular rate sensor with integrated impulse jet pump assembly. 4,295,373, Cl. 73-505.000.

Moiso, Ugo; Massabo, Vincenzo; and Domenis, Danilo. Pyrazolonyl substituted disazo pigments. 4,296,028, Cl. 260-160.000.

Mollet, Hans: *See*—
Haberli, Roland; Mollet, Hans; and Scherer, Gustaaf, 4,295,850, Cl. 8-524.000.

Momiyama, Kikuo; and Kumazawa, Kenichi, to Canon Kabushiki Kaisha. Single lens reflex camera. 4,295,723, Cl. 354-155.000.

Monash University: *See*—
Potter, Owen E., 4,295,281, Cl. 34-10.000.

Mones, Arthur H.: *See*—
Neuhoff, Donald; Mones, Arthur H.; and Lam, Man K., 4,295,271, Cl. 29-840.000.

Monex Corporation: *See*—
Perlman, Milton, 4,295,318, Cl. 52-693.000.

Monsanto Company: *See*—
Middlebrook, Robert E.; Harvey, George R.; and Chupp, John P., 4,296,254, Cl. 564-214.000.

Montalto, Michael S.; Blanding, Douglass L.; and Smith, Michael R., to Eastman Kodak Company. Slide distributor for a chemical analyzer. 4,296,070, Cl. 422-65.000.

Monti, Paolo: *See*—
Toti, Gabriele; Lenzi, Giuliano; and Monti, Paolo, 4,295,660, Cl. 280-714.000.

Moore, Arlan G., to von Hellens, C. Robert. Skateboard having flexible sides. 4,295,656, Cl. 280-87.04A.

Moore, Howard H., to McMurry/Hughes, Inc. Gas lift apparatus. 4,295,796, Cl. 417-115.000.

Moore, W. Edward C.; and Blanks, James A., to VPI Educational Foundation. Apparatus for breaking bacterial cells. 4,295,613, Cl. 241-2.000.

Moore, William J. M.; Kusters, Norbert L.; and So, Eddy, to Canadian Patents & Dev. Ltd. Active quadrature current reference source. 4,296,369, Cl. 323-218.000.

Moravec, Terrence D.: *See*—
Benson, Henry E.; and Moravec, Terrence D., 4,295,918, Cl. 156-434.000.

Mori, Kenji; and Sasaki, Mitsuru, to Sumitomo Chemical Company, Limited. Selective method for the preparation of insect pheromone. 4,296,036, Cl. 260-340.700.

Morishita, Hirosada: *See*—
Takahashi, Akio; Itoh, Yutaka; Wajima, Motoyo; Morishita, Hirosada; and Nishikawa, Akio, 4,296,219, Cl. 525-488.000.

Moritz, Bertil, to ASEA Aktiebolag. Structure for preventing winding collapse. 4,296,395, Cl. 336-60.000.

Moriya, Takeo; and Yamagata, Toshio, to Kimoto & Co., Ltd. Photosensitive positive diazo material with copolymer of acrylamide and diacetoneacrylamide and a process for developing to form color relief image. 4,296,193, Cl. 430-149.000.

Morlock, Gerhard: *See*—
Bugdahl, Volker; Morlock, Gerhard; Reidt, Werner; and Kerschner, Emil, 4,296,006, Cl. 260-23.0EP.

Morota, Kazutoshi; and Yuda, Takuo, to Nissan Motor Co., Ltd.; and Nifco, Inc. Device for fixing pipes, rods and other elongated bodies. 4,295,618, Cl. 248-73.000.

Morotti, Mauro: *See*—
Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, 4,296,125, Cl. 424-315.000.

Morris, Robert L. Van modifiers. 4,295,678, Cl. 296-156.000.

Morris, Roger E.; and Jorgensen, August H., Jr., to B. F. Goodrich Company, The. Nitrile rubber containing cadmium antioxidants. 4,296,007, Cl. 260-23.70N.

Morrison-Knudsen Co., Inc.: *See*—
Waterman, Fred W.; McCleery, Jerry E.; and McKie, Robert T., 4,295,427, Cl. 104-32.00R.

Morrison, Leonard A.: *See*—
Spainhour, Phillip A.; Morrison, Leonard A.; and Hampton, Robert S., Jr., 4,295,634, Cl. 254-10.500.

Mosher, Joseph C.: *See*—
Grote, Daniel; Raymond, Duane; and Mosher, Joseph C., 4,295,262, Cl. 29-462.000.

Mostek Corporation: *See*—
Eaton, Sargent S., Jr.; and Schroeder, Paul R., 4,296,480, Cl. 365-222.000.

Motegi, Shoji: *See*—
Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, 4,296,346, Cl. 310-242.000.

Motorola, Inc.: *See*—
Gunter, Thomas G.; Tredennick, Harry L.; and McAlister, Doyle V., 4,296,469, Cl. 364-200.000.
Thomas, James S., 4,296,338, Cl. 307-362.000.

Mott, James D., to Hydril Company. Well safety system method and apparatus. 4,295,523, Cl. 166-250.000.

Mottier, Francois M.: *See*—
Palma, Gary E.; and Mottier, Francois M., 4,295,741, Cl. 356-349.000.

Motz, Kaye L., to Conoco Inc. Waterflood method. 4,295,980, Cl. 252-8.55D.

Mowbray, Dorian F.: *See*—
Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., 4,295,453, Cl. 123-499.000.

Muacevic, Gojko: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.

Muchowski, Joseph M.; and Venuti, Michael C., to Syntex (U.S.A.) Inc. Preparation of unsaturated aliphatic insect pheromones using cyclic phosphonium ylids. 4,296,042, Cl. 260-345.90R.

Muhling, Alois; Reissner, Frank; and Schmidt, Helmut, to Siemens Aktiengesellschaft. Gearing for a motor driven timing relay. 4,295,380, Cl. 74-3.500.

Muller, Hans-Jurgen: *See*—
Pedain, Josef; Uerdingen, Walter; and Muller, Hans-Jurgen, 4,296,230, Cl. 528-67.000.

Muller, Johann: *See*—
Innertsberger, Ernst; Sommer, Oswin; Bosch, Erhard; Muller, Johann; and Schiller, August, 4,296,228, Cl. 528-33.000.

Muller, Rolf: *See*—
Purr, Horst; Kistler, Manfred; and Muller, Rolf, 4,295,913, Cl. 156-345.000.

Muller, Wolfgang: *See*—
Bergner, Dieter; Hannesen, Kurt; Muller, Wolfgang; and Schulte, Wilfried, 4,295,945, Cl. 204-128.000.
Johne, Hans; Muller, Wolfgang; Jentzsch, Arndt; and Schumann, Gunter, 4,295,423, Cl. 101-349.000.

Mullett, William L., to NUS Corporation. Apparatus for disposing of radioactive fuel channels. 4,295,401, Cl. 83-864.000.

Munson, Harry R., Jr., to A. H. Robins Company, Inc. Mucolytic benzene and thiophene-carbothioic acid 2-aminoalkyl ester acid salts. 4,296,092, Cl. 424-43.000.

Murakoshi, Makoto: *See*—
Oosaka, Shigenori; and Murakoshi, Makoto, 4,295,589, Cl. 226-122.000.

Murdock, Keith C.: *See*—
Lang, Stanley A., Jr.; and Murdock, Keith C., 4,296,030, Cl. 260-239.00A.

Murotani, Tatsunori, to Nippon Electric Co., Ltd. Logic circuit comprising circuits for producing a faster and a slower inverted signal. 4,296,339, Cl. 307-450.000.

Muscatell, Ralph. Thermal and vacuum tracking carburetor jet. 4,295,450, Cl. 123-435.000.

Muskogee Environmental Conservation Co.: *See*—
Scriminger, William F., 4,295,744, Cl. 366-3.000.

Myochin, Hisashi, to Minolta Camera Kabushiki Kaisha. Apparatus for removing residual toner. 4,295,239, Cl. 15-1.50R.

N.A.D., Inc.: *See*—
Racz, Gabor; and Allen, Forrest, 4,295,465, Cl. 128-11.000.
Nabutovsky, Samoil I., deceased: *See*—
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.
Nagabhushan, Tattanahalli L.; and Cooper, Alan, to Schering Corporation. Process for the preparation of chiral 3-amino-2-hydroxypropionic acid and N-blocked derivatives thereof. 4,296,242, Cl. 560-160.000.
Nahar, Rathindra; and Dietze, Robert H., to Burroughs Corporation. Document hopper with eccentric floor cylinders and a front auger. 4,295,645, Cl. 271-34.000.
Naito, Nagayoshi: *See*—
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.
Naitoh, Katsumi, to NSK-Warner K.K.; and Nissan Motor Co., Ltd. Safety belt wind-up device. 4,295,684, Cl. 297-475.000.
Nakahama, Syuhei; and Yamashita, Etsu, to Carrier Corporation. Apparatus for welding impeller. 4,296,308, Cl. 219-136.000.
Nakai, Masaaki: *See*—
Sahara, Masayoshi; and Nakai, Masaaki, 4,295,724, Cl. 354-238.000.
Nakai, Shinzo; and Shimizu, Chitomi, to Hiraoka & Co., Ltd. Apparatus for continuously coating a sheet material concurrently with a plurality of stripes. 4,295,440, Cl. 118-412.000.
Nakai, Taiichiro; Furusawa, Kahei; and Ejiri, Yoshihiro, to Kokusai Denshin Denwa Kabushiki Kaisha. Feed through for optical submerged repeater. 4,295,707, Cl. 350-96.200.
Nakai, Yoshio: *See*—
Kamada, Kazumasa; Nakai, Yoshio; and Abe, Kazunori, 4,296,214, Cl. 525-2.000.
Nakamura, Hiroya, to Konishiroku Photo Industry Co., Ltd. Device for adjusting image density in composite information recording apparatus. 4,296,423, Cl. 346-160.000.
Nakamura, Kenichi: *See*—
Shibatani, Juichi; Nakamura, Kenichi; Izuhara, Wataru; and Obu, Yuichiro, 4,295,549, Cl. 188-218.00A.
Nakanishi, Toshiharu; Suzuki, Miyo; and Ohigashi, Hiroji, to Toray Industries, Inc. Ultrasonic transducer. 4,296,349, Cl. 310-335.000.
Nakano, Takuo: *See*—
Matsubara, Akira; Sakai, Hideaki; Odate, Makoto; Suganuma, Toshio; and Nakano, Takuo, 4,296,112, Cl. 424-246.000.
Nakao, Kouzo: *See*—
Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, 4,296,439, Cl. 358-257.000.
Nakayama, Katsuichi: *See*—
Itoh, Koichi; Koshida, Osamu; and Nakayama, Katsuichi, 4,295,354, Cl. 72-225.000.
Nakayama, Koichi: *See*—
Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, 4,296,216, Cl. 525-66.000.
Nakayama, Yasuaki, to Citizen Watch Company Limited. Watch movement construction. 4,296,488, Cl. 368-80.000.
Nakayama, Yoshihiko: *See*—
Tachibana, Keiji; Nakayama, Yoshihiko; Kaneko, Junichi; and Ishii, Susumu, 4,295,792, Cl. 417-15.000.
Nakazima, Kooichi; Kazama, Keizo; and Oki, Hiroshi, to Hitachi, Ltd. Banded-type implosion protection cathode ray tubes. 4,295,574, Cl. 220-2.10A.
Nalco Chemical Company: *See*—
Aitken, Thomas; Kowalski, David J.; and Srinivasan, K. G., 4,295,930, Cl. 162-158.000.
Breslin, Michael D., 4,295,928, Cl. 162-73.000.
Slovinsky, Manuel, 4,295,762, Cl. 405-264.000.
Naloc Chemical Company: *See*—
Pocius, Frances C., 4,295,932, Cl. 162-161.000.
Narozny, Ronald S.; and Wyss, Robert P., to Thomas & Betts Corporation. Side probeable connector using flat cable. 4,295,704, Cl. 339-99.00R.
Nasman, John O.; and Hogfeldt, Carl-Erik. Method of sterilizing material, especially bandage and surgical instruments, in an autoclave operating with vacuum and steam. 4,296,067, Cl. 422-26.000.
National Can Corporation: *See*—
Sauer, Donald G., 4,295,811, Cl. 425-112.000.
National Institute for Metallurgy: *See*—
Stewart, Alistair B.; and Barker, Ian J., 4,296,269, Cl. 13-12.000.
National Semiconductor Corporation: *See*—
Burns, Carmen D., 4,295,912, Cl. 156-324.000.
Penn, Eric J.; and Teegarden, Derylle L., 4,295,258, Cl. 29-283.000.
Natzke, Ronald C.; and Brown, Thomas R., to J. I. Case Company. Backhoe bucket quick coupler. 4,295,287, Cl. 37-103.000.
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; and Shamsha, Ljudmila F. Method and apparatus for electrochemical purification of contaminated liquids. 4,295,946, Cl. 204-149.000.
Neal, Warren D.; and Nicodemus, Robert N., Jr., to Acco Industries Inc. Conveyor system with diverter. 4,295,559, Cl. 198-598.000.
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, to Roussel Uclaf. 3-Aryloxy-3-aryl-propaneamines and their method of use. 4,296,126, Cl. 424-316.000.
Nederlof, Leendert; and Salters, Roelof H. W., to U.S. Philips Corporation. Word-organized, content-addressable memory. 4,296,475, Cl. 364-900.000.
Nehra, Samuel A. Plating method and structure. 4,296,181, Cl. 428-626.000.
Neill, Daniel L.: *See*—
Becker, James; and Neill, Daniel L., 4,295,687, Cl. 303-20.000.
Nelle, Gunther; and Swassek, Gunter, to Dr. Johannes Heidenhain GmbH. Longitudinal measuring device. 4,295,742, Cl. 356-373.000.
Nelson, Alfred R.; and Johnsen, Kenneth E., to Dow Chemical Co., The. Solvent blends for ethylene copolymers. 4,296,019, Cl. 260-33.40R.
Nelson, David M., to United States Gypsum Company. Steel clad wood door frame. 4,295,299, Cl. 49-504.000.
Nelson, Gary L.; and Harvey, William A., to Sperry Corporation. Magneto-optic Bi_1 Lu_2 Fe_5O_{12} crystals. 4,295,988, Cl. 252-584.000.
Nelson, Melvin A.: *See*—
Franks, Larry A.; and Nelson, Melvin A., 4,296,319, Cl. 250-227.000.
Neubauer, Douglas G.: *See*—
Mayer, Steven T.; Miner, Jay G.; Neubauer, Douglas G.; and Decuir, Joseph C., 4,296,476, Cl. 364-900.000.
Neubauer, Michael L., to Varian Associates, Inc. Traveling wave tube with frequency variable sever length. 4,296,354, Cl. 315-3.500.
Neuenschwander, Rudolf: *See*—
Kaiser, Paul H.; Neuenschwander, Rudolf; and Norton, Henry J., 4,296,161, Cl. 428-171.000.
Neuhoff, Donald; Mones, Arthur H.; and Lam, Man K., to Honeywell Information Systems Inc. Method of soldering a lead to a sintered lead pad. 4,295,271, Cl. 29-840.000.
Neumann, Konrad; Schenkenberger, Ernst; and Resch, Friedrich, to Ciba-Geigy Corporation. Process for the production of negligibly dusty preparation. 4,295,851, Cl. 8-524.000.
Neuringer, Jules K., to Portronix Communications Inc. Location transmitting system. 4,296,408, Cl. 340-539.000.
Neyrpic: *See*—
Boussuges, Pierre, 4,295,782, Cl. 415-1.000.
NGK Insulators, Ltd.: *See*—
Ishihara, Takeshi; Goto, Daisaku; and Sugiura, Hitoshi, 4,296,276, Cl. 174-179.000.
Matsuhisa, Tadaaki; Soejima, S! geo; and Yamamoto, Noboru, 4,295,892, Cl. 501-120.000.
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Nihon Automatic Machinery Mfg. Co., Ltd.: *See*—
Kamei, Takeji, 4,295,972, Cl. 210-710.000.
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Hirayama, Tsutomu; and Hada, Hiroshi, 4,296,357, Cl. 315-169.400.
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Nomura, Hirokazu; and Fujioka, Tadashi, 4,296,306, Cl. 219-124.340.
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Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, 4,295,455, Cl. 123-569.000.
Nisshin Flour Milling Co., Ltd.: *See*—
Tanaka, Kenji; and Endo, Shigeru, 4,296,133, Cl. 426-23.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Hachiro, Nobuaki, 4,295,412, Cl. 91-468.000.
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Arima, Ryoji; Umezawa, Kazushige; and Nisugi, Tokuzo, 4,295,882, Cl. 75-52.000.
Noble, Allen T. Land irrigating system and method. 4,295,607, Cl. 239-1.000.
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Terry, Robert R.; and Boone, Jacob J., 4,295,573, Cl. 215-348.000.
Noren, Borje: *See*—
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Noritsu Koki Co., Ltd.: *See*—
Nishimoto, Kanichi, 4,295,728, Cl. 354-321.000.
Norris, James P.: *See*—
Martin, Howard; and Norris, James P., 4,295,827, Cl. 433-81.000.
Norsk Hydro a.s.: *See*—
Kongshaug, Gunnar, 4,295,895, Cl. 134-22.00R.
Northern Telecom Limited: *See*—
Osborne, Brian T., 4,295,703, Cl. 339-98.000.
Udayasekaran, Rajasekaran, 4,296,281, Cl. 179-18.0EB.
Norton, Henry J.: *See*—
Kaiser, Paul H.; Neuenschwander, Rudolf; and Norton, Henry J., 4,296,161, Cl. 428-171.000.
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Lang-Ree, Nils, 4,295,418, Cl. 99-355.000.
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Naitoh, Katsumi, 4,295,684, Cl. 297-475.000.
Nuken GmbH: *See*—
Brunner, Herbert, 4,295,745, Cl. 366-302.000.
Numata, Saburo, to Fuji Photo Optical Co., Ltd. Mode change-over device for automatic exposure control camera. 4,295,716, Cl. 354-30.000.
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NUS Corporation: *See*—
Mullett, William L., 4,295,401, Cl. 83-864.000.
O'Brien, Joseph P.: *See*—
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Obu, Yuichiro: *See*—
Shibatani, Juichi; Nakamura, Kenichi; Izuhara, Wataru; and Obu, Yuichiro, 4,295,549, Cl. 188-218.00A.
Odate, Makoto: *See*—
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Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Oelbermann, Max; and Rademacher, Karl-August, to Rittershaus & Blecher GmbH. Filter conveying device for filter presses. 4,295,970, Cl. 210-230.000.
Oertli AG Dubendorf: *See*—
Schilling, Siegfried, 4,295,821, Cl. 431-353.000.
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Pfeifer, Hermann, 4,295,330, Cl. 57-263.000.
Ogasawara, Fumihiro, to Ricoh Company, Ltd. Photoelectric scanning apparatus. 4,296,441, Cl. 358-293.000.
Ogawa, Tadashi; Ono, Shunichiro; and Shibuya, Kyoichi, to Sumitomo Cement Co., Ltd. Apparatus for continuously producing a cement clinker. 4,295,823, Cl. 432-106.000.
Ogino, Fumiichi, to Takeda Chemical Industries, Ltd. Air filter of polyurethane mesh containing carbon adsorbent. 4,296,166, Cl. 428-283.000.
Ogiwara, Kenzyu; Kawada, Minoru; and Ashida, Teiji, to Hitachi, Ltd.; and Hitachi Service Engineering Co., Ltd. Method for operating fluid machines in spinning-in-air mode. 4,295,781, Cl. 415-1.000.
Ohara, Ichiro, to Hitachi, Ltd. Mounting structure for magnetrons. 4,295,748, Cl. 403-24.000.
Ohashi, Takashi; Okoyama, Toru; and Arai, Katsuhiko, to Bridgestone Tire Company Limited. Fireproof laminates. 4,296,170, Cl. 428-313.000.
Ohigashi, Hiroji: *See*—
Nakanishi, Toshiharu; Suzuki, Miyo; and Ohigashi, Hiroji, 4,296,349, Cl. 310-335.000.
Ohkubo, Hiroyuki, to Sony Corporation. Magnetic signal field sensor that is substantially immune to angular displacement relative to the signal field. 4,296,377, Cl. 324-252.000.
Ohlinger, Manfred: *See*—
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Ohsaka, Yohnosuke; and Tohzuka, Takashi, to Daikin Kogyo Co., Ltd. Process for preparing hexafluoropropene oligomers. 4,296,265, Cl. 570-138.000.
Ohta, Tokuya: *See*—
Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, 4,295,889, Cl. 106-22.000.
Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, to Hitachi Chemical Company, Ltd. Photo-curable coating compositions for building materials. 4,295,947, Cl. 204-159.150.
Ojima, Masahiro: *See*—
Terao, Motoyasu; Shigematsu, Kazuo; Ojima, Masahiro; and Yonezawa, Seiji, 4,296,419, Cl. 346-135.100.
Okami, Yoshiro: *See*—
Umezawa, Hamao; Okami, Yoshiro; and Kondo, Shinichi, 4,296,106, Cl. 424-181.000.
Okamoto, Susumu: *See*—
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Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, 4,295,809, Cl. 425-72.00S.
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Oktay, Sevgin: *See*—
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Okumichi, Toshiharu; Oseto, Osamu; Matsumoto, Keizo; Thuzimoto, Shigenori; and Sanda, Hisanari, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Sizing compositions incorporating ketene dimer. 4,296,012, Cl. 260-29.6XA.
Okuno, Yoshitoshi: *See*—
Yamaguchi, Takashi; Okuno, Yoshitoshi; and Hirose, Chuji, 4,295,581, Cl. 222-192.000.
Olekna, David J.: *See*—
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Olsson, Jan: *See*—
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Olympus Optical Co., Ltd.: *See*—
Fujiwara, Toshihide; and Fujimori, Ryo, 4,295,949, Cl. 204-180.00G.
Kitagawa, Masahiro, 4,295,717, Cl. 354-33.000.
Mizokami, Kazunori, 4,295,718, Cl. 354-50.000.
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Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,295,734, Cl. 355-15.000.
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, to Kyowa Hakko Kogyo Kabushiki Kaisha; and Kitasato Kenkyusho. Antibiotic nanaomycin E and a process for producing the same. 4,296,040, Cl. 260-345.200.
Omya GmbH: *See*—
Barthelmess, Ulrich, 4,295,803, Cl. 417-423.00R.
Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Mercaptoacyl derivatives of keto substituted proline and pipecolic acid. 4,296,113, Cl. 424-246.000.

O'Neil, Joseph T.; Quinn, Thomas M.; and Wang, Tse L., to Bell Telephone Laboratories, Incorporated. Incoming call identification arrangement. 4,296,282, Cl. 179-99.0LS.
Ono, Shunichiro: *See*—
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Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Brush holding apparatus for rotary electric machine. 4,296,346, Cl. 310-242.000.
Oosaka, Shigenori; and Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Device for feeding web with temperature compensating means. 4,295,589, Cl. 226-122.000.
Oppen, Dieter, to Hooker Chemicals & Plastics Corp. Process for coating iron and steel. 4,295,899, Cl. 148-6.160.
Orcon Corporation: *See*—
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,295,905, Cl. 156-174.000.
Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, 4,295,952, Cl. 204-252.000.
Orpen, Kenneth S. E. Pressure frame with bowed side members. 4,295,568, Cl. 206-597.000.
Ortho Diagnostics, Inc.: *See*—
Graham, Henry A., Jr.; Olekna, David J.; Hawk, Johnna B.; and Barrett, Diane M., 4,296,090, Cl. 424-11.000.
Ortho Pharmaceutical Corporation: *See*—
Kane, Vinayak V., 4,296,035, Cl. 260-333.000.
Osborne, Brian T., to Northern Telecom Limited. Connector block. 4,295,703, Cl. 339-98.000.
Oseto, Osamu: *See*—
Okumichi, Toshiharu; Oseto, Osamu; Matsumoto, Keizo; Thuzimoto, Shigenori; and Sanda, Hisanari, 4,296,012, Cl. 260-29.6XA.
Ostergren, Carl D.: *See*—
Leaycraft, Edgar C.; Oktay, Sevgin; and Ostergren, Carl D., 4,296,455, Cl. 361-383.000.
Oswell, Herman R., to United States of America, Army. Selectable drag brakes for rocket range control. 4,295,617, Cl. 244-3.290.
Otomaru, Tadao, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary die cutter. 4,295,843, Cl. 493-354.000.
Ottenberg, Lawrence E.: *See*—
Harrold, Ronald T.; and Ottenberg, Lawrence E., 4,296,003, Cl. 252-570.000.
Ottersbach, Thomas V.: *See*—
Hildebrandt, Eugene F.; and Ottersbach, Thomas V., 4,296,366, Cl. 318-793.000.
Outboard Marine Corporation: *See*—
Blake, Charles H.; and Wood, Donald H., 4,296,363, Cl. 318-349.000.
Borst, Gaylord M., 4,295,833, Cl. 440-63.000.
Owens-Corning Fiberglas Corporation: *See*—
Bemis, Richard S.; and McCartan, Daniel A., 4,296,164, Cl. 428-219.000.
Grime, Paul R., 4,295,697, Cl. 339-22.00R.
Kerle, Edward J.; and Beaver, Terry R., 4,296,009, Cl. 260-28.50R.
Shannon, Richard F., 4,296,169, Cl. 428-298.000.
Owens-Illinois, Inc.: *See*—
Amberg, Christopher P., 4,295,580, Cl. 221-268.000.
Buckingham, James W., 4,296,061, Cl. 264-138.000.
Willingham, Wendell D., 4,295,320, Cl. 53-201.000.
Oximetrix, Inc.: *See*—
Shaw, Robert F.; and Sperinde, John, 4,295,470, Cl. 128-634.000.
Pacciarini, Antonio: *See*—
Manini, Silvio; and Pacciarini, Antonio, 4,295,774, Cl. 414-331.000.
Packer, Bernard A. Energy convertor. 4,295,800, Cl. 417-333.000.
Pai, Panemangalore S.: *See*—
Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, 4,295,846, Cl. 8-186.000.
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, 4,295,847, Cl. 8-189.000.
Paice, Derek A.; and Shimp, Alan B., to United States of America, Interior. Discriminating circuit breaker protection system direct current power distribution systems. 4,296,450, Cl. 361-50.000.
Pako Corporation: *See*—
Kaufmann, Kenneth M., 4,295,729, Cl. 354-324.000.
Pallo, John M.: *See*—
LaPrade, Steve A.; and Pallo, John M., 4,295,669, Cl. 285-47.000.
Palma, Gary E.; and Mottier, Francois M., to United Technologies Corporation. Two-wavelength phase control system. 4,295,741, Cl. 356-349.000.
Pander, Hans J.: *See*—
Eicken, Karl; Rohr, Wolfgang; Pander, Hans J.; and Wuerzer, Bruno, 4,295,875, Cl. 71-88.000.
Panepinto, William, Jr.: *See*—
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Pangeri, Helmut: *See*—
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Papay, Andrew G.; and O'Brien, Joseph P., to Ethyl Corporation. Lubricating oil composition containing boronated N-hydroxymethyl succinimide friction reducers. 4,295,983, Cl. 252-49.600.
Parent, Daniel, to Plastiques Modernes Ltee. Contractable closure member. 4,295,578, Cl. 220-234.000.
Parks, Lawrence R., to Procter & Gamble Company, The. Cross-linked sodium polyacrylate absorbent. 4,295,987, Cl. 252-194.000.
Parlman, Robert M.; and Williams, Ralph P., to Phillips Petroleum Company. Recovering copper by flotation using N-mercaptoalkyl amide depressant. 4,295,962, Cl. 209-167.000.
Parno Corporation: *See*—
Beck, Richard A.; and Presley, Glen T., 4,295,539, Cl. 180-243.000.
Parro, James. Heat exchange method using natural flow of heat exchange medium. 4,295,342, Cl. 62-119.000.
Pascal, Robert A. Molded heavy duty wheel. 4,295,256, Cl. 29-159.010.
Pasker, John W., to Pasker, John W. Music teaching apparatus and method. 4,295,408, Cl. 84-484.000.
Patenaude, Raymond A.; Duke, Steven R.; and Proulx, Edward A., to General Electric Company. Gun bolt locking system. 4,295,410, Cl. 89-12.000.
Paul, Edward L.: *See*—
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Pauze, Denis R.; and Zamek, Otto S., to General Electric Company. Hot-melt polyesterimide-polyisocyanate electrical coating compositions. 4,296,229, Cl. 528-45.000.
Pavan, Charles: *See*—
Joly, Robert; Pavan, Charles; and Carle, Pierre R., 4,296,091, Cl. 424-18.000.
Payne, Alan; and Bunning, Robin G. Portable inverter for transferring bulk goods between pallets. 4,295,776, Cl. 414-405.000.
Payne, John M. Electrostatic cameras. 4,295,714, Cl. 354-3.000.
Payne, Peter R., administrator: *See*—
Mindt, Lothar F. O., deceased; Payne, Peter R., administrator; and Sanderson, George R., 4,296,234, Cl. 536-47.000.
Peachee, C. Theodore: *See*—
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Pearson, Billy J., to Sperry Corporation. Pressure sensitive switch structure. 4,296,406, Cl. 340-166.00R.
Pearson, Joe T.: *See*—
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.
Peck, Wallace C. Corked bottle opener. 4,295,392, Cl. 81-3.320.
Pedain, Josef; Uerdingen, Walter; and Muller, Hans-Jurgen, to Bayer Aktiengesellschaft. Polyurethane coatings produced from (1) a polyisocyanate mixture of polyisocyanates from the diphenol methane series and a polyhydroxy polyether containing at least one tertiary amine nitrogen with (2) a polyol in a two component coating system. 4,296,230, Cl. 528-67.000.
Pelikan A.G.: *See*—
Mecke, Norbert; Schmitt, Franz U.; Schrader, Karl-Heinz; and Blutschkau, Heinke, 4,296,150, Cl. 427-164.000.
Pellerin, Albert. Device for increasing the uniformity of the air-fuel mixture in internal combustion engines. 4,295,458, Cl. 123-590.000.
Pelton, Frank M.; Miller, Clyde A.; and Leney, Thomas F., to Calspan Corporation. Method and apparatus for reducing the effects of scintillation and rejection of clutter in monopulse radars. 4,296,415, Cl. 343-16.00M.
Pemco-Kalamazoo, Inc.: *See*—
Black, John W., 4,295,686, Cl. 301-63.0DD.
Penn, Eric J.; and Teegarden, Derylle L., to National Semiconductor Corporation. Pin puller and inserter. 4,295,258, Cl. 29-283.000.
Penn, Thomas C., to Texas Instruments Incorporated. Method for removing resist layer from substrate with combustible gas burnoff. 4,296,146, Cl. 427-58.000.
Peot, David G., to Singer Company, The. Safety lock-on motor control. 4,296,290, Cl. 200-325.000.
Percarpio, Edward P., to Becton, Dickinson and Company. Cannula pierceable self-sealing closure. 4,295,572, Cl. 215-247.000.
Perkin-Elmer Corporation, The: *See*—
Gerlach, Robert L., 4,296,323, Cl. 250-289.000.
Perlman, Milton, to Monex Corporation. Connector for wooden truss. 4,295,318, Cl. 52-693.000.
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Peschke, Norman, to Dover Corporation. Vapor control system. 4,295,802, Cl. 417-405.000.
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Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, to BASF Aktiengesellschaft. Process for the production of formaldehyde-free finishing agents for cellulosic textiles and the use of such agents. 4,295,846, Cl. 8-186.000.
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, to BASF Aktiengesellschaft. Finishing process for textiles. 4,295,847, Cl. 8-189.000.
Petersen, Jorgen N., to Aktieselskabet Brodrene Hartmann. Tray blank for eggs. 4,295,597, Cl. 229-2.5EC.
Peterson, Donald J. Platform stepladder. 4,295,544, Cl. 182-106.000.
Petitpierre, Jean C.; and Garner, Robert, to Ciba-Geigy Corporation. 3-Indolyl-3-bis-amino-phenyl-phthalide compounds. 4,295,663, Cl. 282-27.500.

Petrillo, Edward W., Jr.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. 4-Azido-1-mercaptoacyl proline. 4,296,033, Cl. 260-326.200.

Petrin, Jerome A. Self-dumping hoisting bucket assembly. 4,295,677, Cl. 294-73.000.

Petroleum Designers, Inc.: *See—*
Pierce, Elwood K., 4,295,665, Cl. 285-3.000.

Petrow, Henry G.; and Weissman, Mark L. Method of removal of chlorine retained by human skin and hair after exposure to chlorinated water, and soap and shampoo compositions adapted to effect said removal. 4,295,985, Cl. 252-105.000.

Pezzot, Adriano. Intermediately cooled air vacuum pump with balancing of the pressures. 4,295,804, Cl. 418-15.000.

Pfannebecker, George W.: *See—*
Dussourd, Jules L.; and Pfannebecker, George W., 4,295,788, Cl. 415-202.000.

Pfefferle, William C.: *See—*
Angwin, Meredith J.; Pfefferle, William C.; and Kesselring, John P., 4,295,818, Cl. 431-7.000.

Pfeifer, Hermann, to Officine Savio, S.p.A. Re-attachment device for an open-end type spinning frame. 4,295,330, Cl. 57-263.000.

Pfeiffer, Ronald E.: *See—*
De Maria, Francesco; and Pfeiffer, Ronald E., 4,296,175, Cl. 428-398.000.

Pfizer Inc.: *See—*
Kadin, Saul B., 4,296,120, Cl. 424-274.000.
Kadin, Saul B., 4,296,129, Cl. 424-309.000.
Wernau, William C., 4,296,203, Cl. 435-104.000.

Philagro: *See—*
Thizy, Andre; Poignant, Pierre; and Pillon, Daniel, 4,295,877, Cl. 71-120.000.

Philip Morris Incorporated: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.

Philipp, Karl-Heinz: *See—*
Finsterwalder, Kurt; Philipp, Karl-Heinz; Riedisser, Gunter; and Voss, Wilfried, 4,295,399, Cl. 83-251.000.

Phillips Petroleum Company: *See—*
Boultinghouse, Harold D., 4,296,151, Cl. 427-255.100.
Burns, Lyle D., 4,295,861, Cl. 44-63.000.
Burns, Lyle D., 4,295,862, Cl. 44-72.000.
Clemens, Lawrence G., 4,296,485, Cl. 367-77.000.
Farfaglia, Silvio T., 4,295,903, Cl. 156-69.000.
Hawley, Gil R., 4,295,998, Cl. 252-439.000.
Hawley, Gil R., 4,296,001, Cl. 252-458.000.
Lewis, Robert J., 4,296,087, Cl. 423-449.000.
Louthan, Jean H.; Cox, Russell C.; and Crawford, William V., 4,295,668, Cl. 285-21.000.
McDaniel, Max P.; and Welch, Melvin B., 4,295,997, Cl. 252-439.000.
Miller, Terry A., 4,296,484, Cl. 367-71.000.
Parlman, Robert M.; and Williams, Ralph P., 4,295,962, Cl. 209-167.000.
Richards, Frank P.; and Taylor, Raymond C., 4,295,838, Cl. 493-105.000.
Tatham, Jack R.; and Shelor, Jerry L., 4,295,251, Cl. 28-112.000.

Philpott, Arthur; and Fuher, Reginald S., to Ready Pen Limited. Transmission assembly. 4,295,391, Cl. 74-782.000.

Pierce, Elwood K., to Petroleum Designers, Inc. Well casing suspension system. 4,295,665, Cl. 285-3.000.

Pierce, Robert C., to Colgate-Palmolive Company. High viscosity dentifrice. 4,296,096, Cl. 424-52.000.

Pignons S.A.: *See—*
Durand, Roger, 4,295,725, Cl. 354-244.000.

Pillon, Daniel: *See—*
Thizy, Andre; Poignant, Pierre; and Pillon, Daniel, 4,295,877, Cl. 71-120.000.

Pine, Lloyd A.: *See—*
Bearden, Roby, Jr.; Aldridge, Clyde L.; and Pine, Lloyd A., 4,295,996, Cl. 252-431.00C.

Pittmann, Robert W.: *See—*
Gass, John C.; Kerr, Noell C.; and Pittmann, Robert W., 4,295,795, Cl. 417-111.000.

Pizzolati, Pierluigi: *See—*
Mezzetti, Sergio; Pizzolati, Pierluigi; and Svelto, Francesco, 4,296,318, Cl. 250-225.000.

Plastiques Modernes Ltee.: *See—*
Parent, Daniel, 4,295,578, Cl. 220-234.000.

Plessey Handel und Investments A.G.: *See—*
Smith, Leslie; Tew, William; and Woolley, Jack, 4,296,458, Cl. 361-433.000.

Plokhuta, Vyacheslav D.: *See—*
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.

Pocius, Frances C., to Naloc Chemical Company. Synergistic blend of biocides. 4,295,932, Cl. 162-161.000.

Podola, Nikolai V.: *See—*
Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M., 4,296,305, Cl. 219-101.000.

Poignant, Pierre: *See—*
Thizy, Andre; Poignant, Pierre; and Pillon, Daniel, 4,295,877, Cl. 71-120.000.

Poirier, Marc; Gauthier, Michel; and Belanger, Andre, to Hydro-Quebec. Method and device for detecting a gaseous anhydride in an oxygen bearing gas. 4,295,939, Cl. 204-1.00T.

Pomonik, George M., to Amtel, Inc. Hose arm coupling for underwater fluid swivel. 4,295,237, Cl. 9-8.00P.

Ponder, James E.: *See—*
Tubbs, Graham S.; and Ponder, James E., 4,295,897, Cl. 148-1.500.

Poole, Carl W.: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.

Porter, Howard L. Rescue locator signal package. 4,295,438, Cl. 116-210.000.

Portronix Communications Inc.: *See—*
Neuringer, Jules K., 4,296,408, Cl. 340-539.000.

Pospich, Gunther: *See—*
Zimmermann, Wolfgang; Schindler, Hermann; and Pospich, Gunther, 4,296,210, Cl. 521-85.000.

Potter, Owen E., to Monash University. Drying solid materials. 4,295,281, Cl. 34-10.000.

Poulson, Larry: *See—*
Langhammer, Jerome, 4,295,419, Cl. 99-427.000.

PPG Industries, Inc.: *See—*
Fahey, Dennis M., 4,296,173, Cl. 428-378.000.
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.
Stroke, Frederick G., 4,295,890, Cl. 501-90.000.

Prefco Products, Inc.: *See—*
McCabe, Francis J., 4,295,486, Cl. 137-80.000.

Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See—*
Schuberth, Christian; and Hartmann, Rudolf, 4,296,292, Cl. 200-336.000.

Preisler, James M., to Rudd, Thomas H. Motorcyle apparatus. 4,295,964, Cl. 210-130.000.

Presley, Glen T.: *See—*
Beck, Richard A.; and Presley, Glen T., 4,295,539, Cl. 180-243.000.

Presley, Michael: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.

Presley, Waller & Presley: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.

Presley, William E.: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.

Priesmeyer, Charles H., to Mark Controls Corporation. Control valve. 4,295,602, Cl. 236-93.00B.

Priesnitz, Uwe: *See—*
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,296,241, Cl. 560-124.000.

Procter & Gamble Company, The: *See—*
Parks, Lawrence R., 4,295,987, Cl. 252-194.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Bouvet, Pierre; and Lalu, Jean-Pierre, 4,296,034, Cl. 260-326.820.
Dessaint, Andre L.; and Perronin, Jean, 4,295,976, Cl. 252-8.900.

Proulx, Edward A.: *See—*
Patenaude, Raymond A.; Duke, Steven R.; and Proulx, Edward A., 4,295,410, Cl. 89-12.000.

Prout, Wesley C., to Hosmer/Dorrance Corporation. Limb engaging band for orthotic device. 4,295,466, Cl. 128-80.00R.

Przedsiebiorstwo Montazu Elektrycznego "Elektrobudowa": *See—*
Hologa, Zygmunt; Madeyski, Krystyn; and Kurowski, Adam, 4,296,273, Cl. 174-99.00B.

Pullman Incorporated: *See—*
Knippel, Willis H.; and Ferris, Ray, 4,295,430, Cl. 105-308.00E.

Pundt, Richard A. Window regulator. 4,295,298, Cl. 49-353.000.

Punshon, William D.; and Peachee, C. Theodore, to Emerson Electric Co. Method of assembling an electric motor. 4,295,268, Cl. 29-596.000.

Purr, Horst; Kistler, Manfred; and Muller, Rolf, to Mathias Bauerle GmbH. Electrically operated device, especially duplicating device, with a receptacle to accommodate fluid for the chemical treatment of objects. 4,295,913, Cl. 156-345.000.

Purrer, Josef: *See—*
Maier, Martin; Purrer, Josef; and Clemens, Ronald, 4,295,323, Cl. 56-10.200.

Purton, Robert M., to Dresser Industries, Inc. Cleanout apparatus for flow control valves. 4,295,487, Cl. 137-242.000.

Pustka, Zdenek; and Krejcir, Oldrich, to Vysoka skola strojni a textilni. Universal pneumatic bellows jack lifter. 4,295,635, Cl. 254-93.0HP.

Quaas, Gary F., to Becton, Dickinson and Company. Blood collection assembly for preventing outward movement of the blood container. 4,295,476, Cl. 128-764.000.

Quiney, Kenneth M., to Girling Limited. Brake actuator. 4,295,548, Cl. 188-72.700.

Quinn, Thomas M.: *See—*
O'Neil, Joseph T.; Quinn, Thomas M.; and Wang, Tse L., 4,296,282, Cl. 179-99.0LS.

Rabe, Jerry R., to General Electric Company. Multi-speed motor. 4,296,344, Cl. 310-184.000.

Racal Recorders, Ltd.: *See—*
Lewis, John A., 4,296,447, Cl. 360-113.000.

Racz, Gabor; and Allen, Forrest, to N.A.D., Inc. Laryngoscope blade. 4,295,465, Cl. 128-11.000.

Rademacher, Karl-August: *See*—
Oelbermann, Max; and Rademacher, Karl-August, 4,295,970, Cl. 210-230.000.
Rader, Charles G.: *See*—
Bommaraju, Tilak V.; Dexter, Theodore H.; and Rader, Charles G., 4,295,951, Cl. 204-242.000.
Radjukevich, Leonid V.: *See*—
Anisimov, Vyacheslav I.; Bulgakov, Evgeny G.; Gurin, Vasily N.; Radjukevich, Leonid V.; Trishevsky, Igor S.; Trishevsky, Oleg I.; Kheifets, Grigory R.; and Jurchenko, Anatoly B., 4,295,353, Cl. 72-180.000.
Ragheb, A. Kadry. Magnetic switching device for contact-dependent and contactless switching. 4,296,394, Cl. 335-207.000.
Railcar Maint. Co.: *See*—
Waterman, Fred W.; McCleery, Jerry E.; and McKie, Robert T., 4,295,427, Cl. 104-32.00R.
Ramos, Rey C.: *See*—
Ziccarelli, Salvatore F.; Ramos, Rey C.; and Brown, Robert M., 4,296,136, Cl. 426-533.000.
Ramsey Engineering Company: *See*—
Erb, Tom L.; and Miller, Wendell D., 4,295,378, Cl. 73-861.250.
Randall, John M.: *See*—
Camirand, Wayne M.; Randall, John M.; and Hautala, Earl, 4,295,333, Cl. 60-641.600.
Randin, Jean-Paul, to Ebauches S.A. Method of preparing a polymeric electrolyte particularly for an electro-optical device. 4,296,016, Cl. 260-29.6SQ.
Rannenberg, George C., to United Technologies Corporation. Combined air cycle heat pump and refrigeration system. 4,295,518, Cl. 165-2.000.
Rasello, Franco: *See*—
Milana, Emilio; and Rasello, Franco, 4,296,333, Cl. 250-572.000.
Rassias, John N. Building blocks, wall structures made therefrom and methods of making the same. 4,295,313, Cl. 52-438.000.
Rauterkus, Karl J.: *See*—
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,296,226, Cl. 526-316.000.
Raven-Donners, Paula A. M.: *See*—
Jongsma, Cornelis; Frijns, Leon H. B.; and Raven-Donners, Paula A. M., 4,296,245, Cl. 562-494.000.
Raymond, Duane: *See*—
Grote, Daniel; Raymond, Duane; and Mosher, Joseph C., 4,295,262, Cl. 29-462.000.
Raytheon Company: *See*—
MacMaster, George H.; and Dudley, Kenneth W., 4,296,298, Cl. 219-10.810.
RCA Corporation: *See*—
Comizzoli, Robert B.; and Vibronek, Robert D., 4,296,370, Cl. 324-54.000.
Dodds, Dennis L., 4,296,359, Cl. 315-370.000.
Hoover, Merle V., 4,296,382, Cl. 330-264.000.
Hsu, Sheng T., 4,295,266, Cl. 29-571.000.
Keizer, Eugene O.; and Alphonse, Gerard A., 4,296,371, Cl. 324-61.00R.
Kiess, Helmut G.; and Binggeli, Bruno K., 4,296,478, Cl. 365-112.000.
Kuzminski, Henry W., 4,296,189, Cl. 430-5.000.
Maby, Edward W.; Kawamoto, Hirohisa; and Valembois, Pierre V., 4,296,144, Cl. 427-38.000.
Schelhorn, Robert L., 4,296,272, Cl. 174-68.500.
Siryj, Bohdan W., 4,295,621, Cl. 248-183.000.
Warren, Henry R., 4,296,430, Cl. 358-8.000.
Zorbalas, George S., 4,296,446, Cl. 360-73.000.
Ready Pen Limited: *See*—
Philpott, Arthur; and Fuher, Reginald S., 4,295,391, Cl. 74-782.000.
Rebikoff, Dimitri. High pressure and high speed optical enclosure system. 4,295,721, Cl. 354-64.000.
Redland Automation Limited: *See*—
Duley, Richard K., 4,296,401, Cl. 340-38.00L.
Reedy, Charles B., to Benedictine Monks Inc. Stove. 4,295,459, Cl. 126-60.000.
Reeves, H. Neal; Burnett, Roy E.; Denham, Leslie R.; and Shields, George E., to Seiscom Delta Inc. Seismic exploration with disposable seismic detectors. 4,295,542, Cl. 181-108.000.
Regan, Michael D. Apparatus for producing high purity water. 4,296,328, Cl. 250-436.000.
Reichert, Manfred: *See*—
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, 4,295,847, Cl. 8-189.000.
Reid, Gilbert R., to Burroughs Corporation. Electronic package for high density integrated circuits. 4,296,456, Cl. 361-403.000.
Reidt, Werner: *See*—
Bugdahl, Volker; Morlock, Gerhard; Reidt, Werner; and Kerschner, Emil, 4,296,006, Cl. 260-23.0EP.
Reimers, George W.: *See*—
Khalafalla, Sanaa E.; and Reimers, George W., 4,295,971, Cl. 210-695.000.
Reindl, Hermann: *See*—
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.
Reinert, Friedrich: *See*—
Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, 4,295,846, Cl. 8-186.000.
Reinhard Mohn GmbH: *See*—
Beckert, Alexander; and Knobbe, Karl-Heinz, 4,296,294, Cl. 219-10.410.
Reissner, Frank: *See*—
Muhling, Alois; Reissner, Frank; and Schmidt, Helmut, 4,295,380, Cl. 74-3.500.
Rekant, Uriel. Process for the production of energy from solid hydrocarbon fuels. 4,295,331, Cl. 60-39.020.
Renth, Ernst-Otto: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.
Resch, Friedrich: *See*—
Neumann, Konrad; Schenkenberger, Ernst; and Resch, Friedrich, 4,295,851, Cl. 8-524.000.
Revak, Timothy T.: *See*—
Anand, Joginder N.; Revak, Timothy T.; and Tsang, Floris Y., 4,296,052, Cl. 264-25.000.
Reynolds and Reynolds Company, The: *See*—
Kelly, Robert J., 4,295,642, Cl. 270-53.000.
Rhau, Siegfried; and Weber, Adolf, to Diehl GmbH & Co. Process for the production of metallic formed members. 4,296,180, Cl. 428-558.000.
Rheindorf, Hans H.: *See*—
Aigle, Karl; Hieber, Udo; Huebscher, Wilhelm; Rheindorf, Hans H.; and Wiedemann, Rolf, 4,296,453, Cl. 361-275.000.
Rhodes, Curtis A.; Jur, Tim A.; and Keating, Donald A., to Canron Corp. Method of filling spike holes in railway ties. 4,295,259, Cl. 29-402.180.
Rhum, David, to Celanese Corporation. Stable vinyl acetate and amine monomer copolymer emulsions. 4,296,225, Cl. 526-260.000.
Rich, Leonard G., to Gulf & Western Corporation. Device for converting analog signals from a natural leaf scanner into digital signals and method of operating same. 4,296,405, Cl. 340-146.3AG.
Richards, Frank P.; and Taylor, Raymond C., to Phillips Petroleum Company. Method of producing cylindrical containers. 4,295,838, Cl. 493-105.000.
Richards, John S.: *See*—
Dabisch, Kenneth W.; and Richards, John S., 4,296,314, Cl. 235-92.0SB.
Richardson, Warren N., to TRW Inc. Self-referencing position switch. 4,296,286, Cl. 200-61.540.
Richie, Ronald A. Wall mounted speaker system. 4,296,280, Cl. 179-1.00E.
Richter Gedeon Vegyeszeti Gyar: *See*—
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, 4,296,072, Cl. 422-254.000.
Ricketts, James R.: *See*—
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Ricoh Co., Ltd.: *See*—
Hasegawa, Haruo; Taniguchi, Hiroyoshi; and Igawa, Takao, 4,296,190, Cl. 430-57.000.
Imai, Mitsuru, 4,296,171, Cl. 428-323.000.
Ogasawara, Fumihiro, 4,296,441, Cl. 358-293.000.
Yamazaki, Hiroshi; and Isayama, Takuro, 4,296,418, Cl. 346-75.000.
Ridgway, Donald H.: *See*—
Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., 4,296,159, Cl. 428-95.000.
Riebel, Hans-Jochem: *See*—
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Riedisser, Gunter: *See*—
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Rieke Corporation: *See*—
Schurr, Robert E., 4,295,583, Cl. 222-478.000.
Riessberger, Klaus: *See*—
Theurer, Josef; and Riessberger, Klaus, 4,295,764, Cl. 409-296.000.
Rilly, Gerard, to Thomson-Brandt. Switched-mode frame-scan control circuit for a videofrequency receiver. 4,296,360, Cl. 315-387.000.
Rinno, Helmut: *See*—
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,296,226, Cl. 526-316.000.
Risse, Heinrich: *See*—
Lollert, Bernd; and Risse, Heinrich, 4,295,382, Cl. 74-68.000.
Ritter, Horst, to Dr. C. Otto & Comp. G.m.b.H. Distributor for washing fluid in a scrubber or stripper. 4,296,049, Cl. 261-111.000.
Rittershaus & Blecher GmbH: *See*—
Oelbermann, Max; and Rademacher, Karl-August, 4,295,970, Cl. 210-230.000.
RJR Archer, Inc.: *See*—
Yeatts, Roy E., 4,295,478, Cl. 131-336.000.
Robert Bosch GmbH: *See*—
Friese, Karl-Hermann, 4,296,148, Cl. 427-125.000.
Lembke, Manfred; and Knapp, Heinrich, 4,295,452, Cl. 123-470.000.
Ruhl, Karl; and Kemmner, Ulrich, 4,295,797, Cl. 417-203.000.
Schlagmuller, Walter; and Babitzka, Rudolf, 4,295,554, Cl. 192-105.0CE.
Sochor, Josef, 4,296,444, Cl. 360-65.000.
Roberts, Geoffrey M.: *See*—
Tomov, Nenad R.; and Roberts, Geoffrey M., 4,295,943, Cl. 204-96.000.
Robertson, Forrest E.: *See*—
Williams, Donald E.; Robertson, Forrest E.; Gigot, C. Dean; and Gigot, Terry K., 4,295,532, Cl. 172-184.000.

Robertson, Wayne M.; and Wert, John A., to Rockwell International Corporation. Method of imparting a fine grain structure to aluminum alloys having precipitating constituents. 4,295,901, Cl. 148-12.70A.
Robin, Marcel. Liquid-metal-cooled nuclear reactor. 4,295,934, Cl. 376-203.000.
Robinair Manufacturing Corporation: *See*—
Cain, Robert L., 4,295,794, Cl. 417-62.000.
Robinson, B. Joel. Catalyst delivery system. 4,295,816, Cl. 431-4.000.
Robinson, Bruce A.; and Thompson, John R., to Du Pont de Nemours, E. I., and Company. Method for measuring yarn shrinkage and crimp development. 4,295,252, Cl. 28-248.000.
Robinson, Douglas K. Electrical apparatus for comparing dark and light areas on a substrate and which substrate is in a liquid. 4,295,727, Cl. 354-298.000.
Robinson Industries, Inc.: *See*—
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Rockwell International Corporation: *See*—
Dabisch, Kenneth W.; and Richards, John S., 4,296,314, Cl. 235-92.0SB.
Haraszti, Tegzi P., 4,296,428, Cl. 357-41.000.
Heinz, Theodore A., 4,295,710, Cl. 350-310.000.
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Vasile, Carmine F., 4,296,486, Cl. 367-140.000.
Yosim, Samuel J., 4,296,074, Cl. 423-4.000.
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Harrington, Alan L.; Rodov, Vladimir; and Allison, Richard, 4,295,267, Cl. 29-571.000.
Rodriguez, Edward T., to Theta-Corporation. Optically coupled electric power relay. 4,296,331, Cl. 250-551.000.
Roeder, Georg; and Sachs, Helmut, to Messer Griesheim GmbH. Gas blending flame cutter. 4,295,820, Cl. 431-191.000.
Rogers, Gerald D., to Texas Instruments Incorporated. Method of making integrated circuit MOS capacitor using implanted region to change threshold. 4,295,264, Cl. 29-571.000.
Rogier, Edgar R., to Henkel Corporation. Polycyclic polyamines. 4,296,004, Cl. 260-18.0EP.
Rohr, Wolfgang: *See*—
Eicken, Karl; Rohr, Wolfgang; Pander, Hans J.; and Wuerzer, Bruno, 4,295,875, Cl. 71-88.000.
Rollmann, Louis D., to Mobil Oil Corporation. Zeolite synthesis. 4,296,083, Cl. 423-329.000.
Roman, Alain; Chevreux, Pierre; Wust, Manfred; and Ehretsmann, Jacques, to Battelle Memorial Institute. Photocurable adhesive from acrylic acid, acrylamide, dimethylaminoethyl methacrylate, benzophenone and methyl ethyl ketone. 4,295,948, Cl. 204-159.230.
Romanelli, Pat; and Romanelli, Robert J. Electronic remote meter reading apparatus. 4,296,411, Cl. 340-870.020.
Romanelli, Robert J.: *See*—
Romanelli, Pat; and Romanelli, Robert J., 4,296,411, Cl. 340-870.020.
Roper, Ralph E., to General Tire & Rubber Co. Apparatus for making metal outers and inners. 4,295,357, Cl. 72-344.000.
Rosemeier, Friedrich; and Killmaier, Horst, to Gambro Dialysatoren GmbH & Co. KG. Connection nipple. 4,295,495, Cl. 138-89.000.
Rosenberg, Peretz. Method and apparatus for producing and assembling articles of molded plastic parts. 4,295,814, Cl. 425-517.000.
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Roeder, Georg; and Sachs, Helmut, 4,295,820, Cl. 431-191.000.
Sadler, William S. Emergency radio frequency warning device. 4,296,496, Cl. 455-1.000.
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Saget, Pierre L. Apparatus for the centrifugal separation of at least two liquid phases and one sedimentary phase of a mixture. 4,295,600, Cl. 233-7.000.
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Satcher, Angel T. Method and structure for recycling soap chips. 4,296,064, Cl. 264-322.000.
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Sato, Masataro. Compositions and methods for the treatment of athlete's foot. 4,296,098, Cl. 424-94.000.
Sato, Ryuichi: *See*—
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Sauer, Donald G., to National Can Corporation. Apparatus for making multilayered containers. 4,295,811, Cl. 425-112.000.
Sauer, Hans; Steinbichler, Wolf; and Antonitsch, Sepp. Contact spring arrangement for an electromagnetic relay. 4,296,393, Cl. 335-125.000.
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Saville, James, to Texasgulf Inc. Process for extraction of platinum group metals from chromite-bearing ore. 4,295,881, Cl. 75-10.00R.
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Schaefer, Hans G.; and Langer, Alfred, to Manhattan R. F. Die Company. Method and apparatus for heat sealing a plurality of sets of continuous plastic strips together by radio frequency energy. 4,295,908, Cl. 156-251.000.
Schafer, August W., to Wilhelm Schafer Maschinenbau. Apparatus for joining and cladding pipe sections. 4,295,592, Cl. 228-17.000.
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Schmid, Michael G.; and Hurt, Roger W. Anti-theft device for liquid storage tanks. 4,295,577, Cl. 220-86.0AT.
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Schmidt, Karl-Julius; Schmidt, Friedrich; Siegle, Peter; and Hansen, Gert, to Bayer Aktiengesellschaft. Continuous preparation of phosphoric acid alkyl ester dichlorides. 4,296,047, Cl. 260-974.000.
Schmidt, Paul. Pneumatically operated ram borer. 4,295,533, Cl. 175-19.000.
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Schmit, Paul F., to Minnesota Mining and Manufacturing Company. Method of heat sealing a film to the lip of a cup. 4,295,904, Cl. 156-69.000.
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Schroeder, James E., to Harris Corporation. VMOS Transistor and method of fabrication. 4,296,429, Cl. 357-55.000.
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Schurr, Robert E., to Rieke Corporation. Closure cap vent. 4,295,583, Cl. 222-478.000.
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Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., to Lucas Industries Limited. Fuel system for an internal combustion engine. 4,295,453, Cl. 123-499.000.
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Sendzimir, Tadeusz. Beam-backed strip mill with attached inserts. 4,295,355, Cl. 72-242.000.
Sepulveda, Ralph R.; and Lander, Lynn H., to Lever Brothers Company. Pretreatment composition for stain removal. 4,295,845, Cl. 8-139.100.
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Ogawa, Tadashi; Ono, Shunichiro; and Shibuya, Kyoichi, 4,295,823, Cl. 432-106.000.
Shields, George E.: *See—*
Reeves, H. Neal; Burnett, Roy E.; Denham, Leslie R.; and Shields, George E., 4,295,542, Cl. 181-108.000.
Shigematsu, Kazuo: *See—*
Terao, Motoyasu; Shigematsu, Kazuo; Ojima, Masahiro; and Yonezawa, Seiji, 4,296,419, Cl. 346-135.100.
Shihata, Alfred A. Ureteric stone extractor with two ballooned catheters. 4,295,464, Cl. 128-1.00R.
Shikoku Kasei Kogyo Co., Ltd.: *See—*
Shimamura, Tadao; and Kojima, Tadayoshi, 4,296,051, Cl. 264-118.000.
Shimada, Wataru; Hoshinouchi, Susumu; Kawaguchi, Kenji; and Yoshida, Akio, to Mitsubishi Denki Kabushiki Kaisha. Method for producing a motion picture screen. 4,295,906, Cl. 156-214.000.
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Shimizu, Akira: *See—*
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,295,734, Cl. 355-15.000.
Shimizu, Chitomi: *See—*
Nakai, Shinzo; and Shimizu, Chitomi, 4,295,440, Cl. 118-412.000.
Shimotake, Munetoshi: *See—*
Kawaguchi, Yasuyosi; Shimotake, Munetoshi; and Yamamoto, Fujio, 4,295,512, Cl. 152-354.00R.
Shimp, Alan B.: *See—*
Paice, Derek A.; and Shimp, Alan B., 4,296,450, Cl. 361-50.000.
Shin-Etsu Polymer Co., Ltd.: *See—*
Sado, Ryoichi, 4,295,700, Cl. 339-61.00M.
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, to Canon Kabushiki Kaisha. Thermal head. 4,296,309, Cl. 219-216.000.
Shinzawa, Motohiro: *See—*
Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, 4,295,455, Cl. 123-569.000.
Shirahata, Kunikatsu: *See—*
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, to Sumitomo Electric Industries, Ltd. Process for producing optical transmission fiber. 4,295,869, Cl. 65-3.110.
Shirato, Yoshiaki: *See—*
Hara, Toshitami; Sato, Yashushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,296,421, Cl. 346-140.00R.
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Shockley, Norman E. Receptacle support apparatus for bicycle. 4,295,586, Cl. 224-32.00R.
Shopin, Viktor M.; Turenko, Leonid G.; Surovikin, Vitaly F.; and Suponev, Konstantin V. Apparatus for separating carbon black from carbon-black aerosol. 4,295,867, Cl. 55-288.000.
Shumaker, John F., to J. I. Case Company. Straight arm loader. 4,295,779, Cl. 414-685.000.
Sick, Erwin, to Erwin Sick GmbH, Optik-Elektronik. Apparatus for determining faults in strip material. 4,295,743, Cl. 356-431.000.
Siegle, Peter: *See—*
Schmidt, Karl-Julius; Schmidt, Friedrich; Siegle, Peter; and Hansen, Gert, 4,296,047, Cl. 260-974.000.
Siegler, Marcel: *See—*
Cioca, Gheorge; and Siegler, Marcel, 4,295,894, Cl. 106-155.000.
Siegmund, Werner, to Mannesmann Aktiengesellschaft. Antifreeze protection of roads. 4,296,207, Cl. 521-53.000.
Siemens Aktiengesellschaft: *See—*
Aigle, Karl; Hieber, Udo; Huebscher, Wilhelm; Rheindorf, Hans H.; and Wiedemann, Rolf, 4,296,453, Cl. 361-275.000.
Becker Friedbert; Steinkamp, Johann; and Koenen, Klaus, 4,296,400, Cl. 340-32.000.
Beyer, Franz; and Sedlmair, Siegfried, 4,296,414, Cl. 343-5.0SW.
Feuerbaum, Hans-Peter, 4,296,372, Cl. 324-71.0EB.
Haensel, Eckhart, 4,296,403, Cl. 340-147.00P.
Muhling, Alois; Reissner, Frank; and Schmidt, Helmut, 4,295,380, Cl. 74-3.500.
Schneider, Hartmut; and Lebetzki, Egon, 4,295,870, Cl. 65-3.120.
Siemens-Albis Aktiengesellschaft: *See—*
Forstner, Anton; and Schatzmann, Kurt, 4,295,441, Cl. 118-425.000.
Siemens-Allis, Inc.: *See—*
Lott, Donald L., 4,296,284, Cl. 200-48.00R.
Siemon, Bernhard, to Schubert & Salzer. Combing machine. 4,295,249, Cl. 19-225.000.
Sienknecht, Walter F. Hand tool leveling apparatus. 4,295,279, Cl. 33-334.000.

Sigmon, James W. Expansible device. 4,295,633, Cl. 251-172.000.
Sigri Elektrographit GmbH: *See*—
Freundlinger, Ernst; and Hirschvogel, Alfred, 4,296,177, Cl. 428-408.000.
Sih, John C., to Upjohn Company, The. 19-Hydroxy-7a-homo-PGI_2 compounds. 4,296,041, Cl. 260-345.200.
Sih, John C., to Upjohn Company, The. 13,14-Dideĥydro-11-deoxy-11-hydroxymethyl-19-oxo-PGF_1 compounds. 4,296,246, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-11-hydroxymethyl-9-deoxy-9-methylene-19-oxo-PGF_1 compounds. 4,296,247, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-11-hydroxymethyl-19-oxo-PGE_1 compounds. 4,296,248, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-9-deoxy-9-methylene-19-oxo-PGE_1 compounds. 4,296,249, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-9-deoxy-9-methylene-19-oxo-PGF_1 compounds. 4,296,250, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-19-keto-PG compounds. 4,296,256, Cl. 568-330.000.
Sih, John C.: *See*—
Axen, Udo F.; and Sih, John C., 4,296,253, Cl. 564-153.000.
Silverberg, Morton, to Xerox Corporation. Grooved belt document registration system. 4,295,737, Cl. 355-76.000.
Sim, William J.; and Marth, Ronald M. Support bracket for distribution panel for cooling towers and the like. 4,296,048, Cl. 261-111.000.
Simcoe, Robert J., to General Electric Company. High voltage standoff MOS driver circuitry. 4,296,335, Cl. 307-200.00B.
Simogawara, Naoaki: *See*—
Yanabu, Satoru; Mizoguchi, Hitoshi; and Simogawara, Naoaki, 4,296,288, Cl. 200-146.00R.
Simons, S. Stoney, Jr., to United States of America, America. Irreversible anti-glucocorticoids. 4,296,206, Cl. 435-240.000.
Simpson, Frank H. Shot and powder dispenser attachment. 4,295,409, Cl. 86-31.000.
Singer Company, The: *See*—
Peot, David G., 4,296,290, Cl. 200-325.000.
Singer, Michael: *See*—
Buckley, Alan J.; and Singer, Michael, 4,295,887, Cl. 106-18.330.
Sio-Societa per l'Industria Dell'Ossigenc e di Altri Gas: *See*—
Bottiglia, Augusto, 4,296,300, Cl. 219-61.700.
Siryj, Bohdan W., to RCA Corporation. Solar tracking apparatus. 4,295,621, Cl. 248-183.000.
Skanadore, William R., to General Semiconductor Co., Inc. Switching circuit and method for avoiding secondary breakdown. 4,296,336, Cl. 307-300.000.
Skierski, Edwin J., to USM Corporation. Chip breaker screws. 4,295,768, Cl. 411-387.000.
Skinner, Doyle P., Jr.: *See*—
Markham, Roger G.; and Skinner, Doyle P., Jr., 4,296,417, Cl. 346-75.000.
Slack, Charles B.: *See*—
Cullison, Steven B.; and Slack, Charles B., 4,296,278, Cl. 179-1.0VL.
Slaugh, Lynn H., to Shell Oil Company. Polymerization catalyst. 4,295,999, Cl. 252-455.00R.
Sleishman, Donald E. Musician's drum. 4,295,405, Cl. 84-413.000.
Slickbar, Inc.: *See*—
Blair, Russell M., 4,295,756, Cl. 405-70.000.
Slovinsky, Manuel, to Nalco Chemical Company. Grouting-soil conditioning systems using polyoxyethylene diacrylates. 4,295,762, Cl. 405-264.000.
Smit Ovens Nijmegen B.V.: *See*—
Wens, Johannes C., 4,295,824, Cl. 432-115.000.
Smith, David E., to Blue Circle Industries Limited. Producing dispersions of preflocculated fillers for use in papermaking. 4,295,933, Cl. 162-168.0NA.
Smith, Don H.; Bowman, Arthur F.; and Junk, Norman M., to Atlas Powder Company. Explosive container for cast primer. 4,295,424, Cl. 102-322.000.
Smith International, Inc.: *See*—
Crase, Gary M.; and Trzeciak, Kurt M., 4,295,535, Cl. 175-101.000.
Smith, James A. Patio door security lock. 4,295,676, Cl. 292-262.000.
Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Catechol or pyrogallol containing flexible insulating tape having low gel time. 4,296,018, Cl. 260-32.8EP.
Smith, Larry C. Note translation device. 4,295,406, Cl. 84-470.00R.
Smith, Leslie; Tew, William; and Woolley, Jack, to Plessey Handel und Investments A.G. Electrolyte capacitors with improved anode-to-lead connection. 4,296,458, Cl. 361-433.000.
Smith, Michael R.; and DiFulvio, Anthony P., to Eastman Kodak Company. Apparatus for processing an analysis slide. 4,296,069, Cl. 422-64.000.
Smith, Michael R.: *See*—
Montalto, Michael S.; Blanding, Douglass L.; and Smith, Michael R., 4,296,070, Cl. 422-65.000.
Smith, Paul R., to DiMarzio Musical Instrument Pickups, Inc. Compensated nut for a lute-type instrument. 4,295,404, Cl. 84-314.00N.
Smith, Peter H.: *See*—
Stottmann, Richard L.; and Smith, Peter H., 4,296,299, Cl. 219-10.810.
Smith, Samuel W. Crutch-mounted accessory pouch. 4,295,483, Cl. 135-66.000.
Snamprogetti S.p.A.: *See*—
Cucinella, Salvatore; Mazzei, Alessandro; and Dozzi, Giovanni, 4,296,045, Cl. 260-448.00R.
Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Genco, Vito; and Turco, Vincenzo L., 4,295,426, Cl. 102-451.000.
Snitzer, Elias: *See*—
Meltz, Gerald; and Snitzer, Elias, 4,295,738, Cl. 356-32.000.
Meltz, Gerald; and Snitzer, Elias, 4,295,739, Cl. 356-43.000.
Snyder, Dennis R., to Bell Telephone Laboratories, Incorporated. Multi-outlet adapter for plug-in telephones. 4,295,702, Cl. 339-97.00P.
Snyder, Richard H.: *See*—
Mapes, Charles W.; and Snyder, Richard H., 4,295,835, Cl. 440-78.000.
Snyder, Wesley L. Laser aiming device with lateral shock absorber. 4,295,289, Cl. 42-1.00A.
So, Eddy: *See*—
Moore, William J. M.; Kusters, Norbert L.; and So, Eddy, 4,296,369, Cl. 323-218.000.
Sochor, Josef, to Robert Bosch GmbH. Inductive signal transducer supply circuit particularly for video recording use. 4,296,444, Cl. 360-65.000.
Societa Pneumatici Pirelli S.p.A.: *See*—
Mezzanotte, Mario; and Turchetti, Gianni, 4,295,511, Cl. 152-354.00R.
Societe Anonyme Automobiles Citroen: *See*—
Goux, Jacques, 4,296,471, Cl. 364-424.000.
Societe de Vente de l'Aluminium Pechiney: *See*—
Hicter, Jean-Marie; and Guerit, Pierre, 4,295,884, Cl. 75-93.00R.
Societe Europeenne de Propulsion: *See*—
Clebant, Jean C., 4,295,671, Cl. 285-223.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Lardellier, Alain M. J., 4,295,785, Cl. 415-174.000.
Lardellier, Alain M. J., 4,295,787, Cl. 415-197.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Mialon, Jacques; and Lamarche, Bernard, 4,295,388, Cl. 74-579.00R.
Sodeco-SAIA SA: *See*—
Guttinger, Kurt, 4,296,341, Cl. 310-41.000.
Sodergren, Robert C.: *See*—
Woods, Rodney G.; Clarke, Charles J., Jr.; and Sodergren, Robert C., 4,296,464, Cl. 364-200.000.
Soejima, Shigeo: *See*—
Matsuhisa, Tadaaki; Soejima, Shigeo; and Yamamoto, Noboru, 4,295,892, Cl. 501-120.000.
Sokoly, Theodore O.; and Niedzialkowski, John, to McGraw-Edison Company. Metal oxide varistor manufacture. 4,296,002, Cl. 252-518.000.
Solly, Barry: *See*—
Malmgren, Nils-Gunnar; Solly, Barry; and Tarnblom, Stig, 4,295,900, Cl. 148-12.00B.
Solvay & Cie: *See*—
Berger, Eugene, 4,296,223, Cl. 526-125.000.
Sommars, Mark F., to Caterpillar Tractor Co. Heat exchanger core mounting apparatus. 4,295,521, Cl. 165-69.000.
Sommer, Oswin: *See*—
Innertsberger, Ernst; Sommer, Oswin; Bosch, Erhard; Muller, Johann; and Schiller, August, 4,296,228, Cl. 528-33.000.
Sonoco Products Company: *See*—
Sansbury, Jerry F., 4,295,840, Cl. 493-278.000.
Sony Corporation: *See*—
Ohkubo, Hiroyuki, 4,296,377, Cl. 324-252.000.
Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, 4,296,443, Cl. 360-10.000.
Sorathia, Usman A. K.: *See*—
Gagliani, John; and Sorathia, Usman A. K., 4,296,208, Cl. 521-77.000.
Southwest Research Institute: *See*—
King, James D., 4,296,378, Cl. 324-313.000.
Spainhour, Phillip A.; Morrison, Leonard A.; and Hampton, Robert S., Jr., to Ammco Tools, Inc. Strut compressor. 4,295,634, Cl. 254-10.500.
Speech Technology Corporation: *See*—
Stork, John E., 4,296,279, Cl. 179-1.0SM.
Speranza, George P.: *See*—
Cuscurida, Michael; and Speranza, George P., 4,296,213, Cl. 521-166.000.
Sperinde, John: *See*—
Shaw, Robert F.; and Sperinde, John, 4,295,470, Cl. 128-634.000.
Sperry Corporation: *See*—
Hill, Roy K., 4,296,332, Cl. 250-570.000.
Kritz, Jacob A., 4,296,482, Cl. 367-91.000.
Nelson, Gary L.; and Harvey, William A., 4,295,988, Cl. 252-584.000.
Pearson, Billy J., 4,296,406, Cl. 340-166.00R.
Thaxter, James B., 4,295,442, Cl. 118-657.000.
Spiegel, Hubert: *See*—
Wuthrich, Hans-Rudolf; Krebs, Peter; Spiegel, Hubert; and Eicher, Franz, 4,296,289, Cl. 200-148.00R.
Spirax Sarco Limited: *See*—
Clayton, Edward R. C.; and Bennett, Alan F., 4,295,605, Cl. 236-56.000.
Spisak, Edward G. Plastic and metal wheel trim assembly. 4,295,685, Cl. 301-37.00P.

Sprague Electric Company: *See*—
Higgs, Jacob K.; and Avery, Grant D., 4,296,410, Cl. 340-686.000.

Sprecher & Schuh AG: *See*—
Wuthrich, Hans-Rudolf; Krebs, Peter; Spiegel, Hubert; and Eicher, Franz, 4,296,289, Cl. 200-148.00R.

Sprecker, Mark A.: *See*—
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,295,978, Cl. 252-8.900.

Spring, David J.: *See*—
Roswell, David G.; Spring, David J.; and Hems, Roger, 4,296,255, Cl. 564-215.000.

Springer, Brice D.: *See*—
Arends, Roger R.; Bailey, Wayne B.; Duffy, John W.; and Springer, Brice D., 4,295,489, Cl. 137-488.000.

Squire, Dereck. Karate board holding and storage device. 4,295,646, Cl. 272-76.000.

Squires, Christopher P.: *See*—
Young, Donald A.; and Squires, Christopher P., 4,296,342, Cl. 310-77.000.

Srinivasan, K. G.: *See*—
Aitken, Thomas; Kowalski, David J.; and Srinivasan, K. G., 4,295,930, Cl. 162-158.000.

Srivastava, Gopal K.: *See*—
Engel, Christopher M.; and Srivastava, Gopal K., 4,296,432, Cl. 358-28.000.

Stachurski, John Z. O. Electrochemical cell. 4,296,184, Cl. 429-14.000.

Stahl, Howard D.: *See*—
Lazarus, Charles R.; Stahl, Howard D.; and Haas, Gerhard J., 4,296,132, Cl. 426-2.000.

Staiger, Gerhard; and Bronstert, Klaus, to BASF Aktiengesellschaft. Manufacture of poly-α-olefins. 4,296,222, Cl. 526-119.000.

Stamicarbon, B.V.: *See*—
Jongsma, Cornelis; Frijns, Leon H. B.; and Raven-Donners, Paula A. M., 4,296,245, Cl. 562-494.000.
Vroomans, Hubertus J., 4,296,023, Cl. 260-45.75F.

Standard Oil Company (Indiana): *See*—
Fahrig, Robert J.; and Hinrichs, Lansing M., 4,295,961, Cl. 208-161.000.
Meshri, Indurani D., 4,295,365, Cl. 73-153.000.
Sharp, Shelby P.; and Yarborough, Lyman, 4,295,979, Cl. 252-8.55E.

Star Manufacturing Company of Oklahoma: *See*—
Kim, Kwon S., 4,295,304, Cl. 52-90.000.

Statni vyzkumny ustav materialu: *See*—
Kupf, Lubomir; Travnicek, Jiri; Adamek, Radomil; and Kyzlink, Josef, 4,295,628, Cl. 249-80.000.

Stauber, Ronald C.: *See*—
Kulin, Ralph; and Stauber, Ronald C., 4,295,619, Cl. 248-95.000.

Stauffer, Adolf, to Davy Powergas GmbH. Heat exchange techniques for the catalytic oxidation of gaseous sulfur compounds to sulfur trioxide. 4,296,088, Cl. 423-533.000.

Stavlo, Lars G., to AGA AB. Pallet for pressurized gas cylinders. 4,295,431, Cl. 108-55.100.

Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Autzen, Horst, to BASF Aktiengesellschaft. Manufacture of acicular ferromagnetic iron particles. 4,295,879, Cl. 75-0.5AA.

Steck, Werner: *See*—
Rudolf, Peter; Steck, Werner; Jakusch, Helmut; Vaeth, Guenter; and Jaeckh, Christof, 4,296,149, Cl. 427-130.000.

Stein, Hermann, to Vorwerk & Sohn GmbH & Co. KG. Emergency track ring for pneumatic vehicle tires. 4,295,509, Cl. 152-158.000.

Steinbichler, Wolf: *See*—
Sauer, Hans; Steinbichler, Wolf; and Antonitsch, Sepp, 4,296,393, Cl. 335-125.000.

Steinkamp, Johann: *See*—
Becker Friedbert; Steinkamp, Johann; and Koenen, Klaus, 4,296,400, Cl. 340-32.000.

Steinlein, Rudolf F., to Alexander Schoeller & Co., AG. Molded case for returnable beverage bottles. 4,295,576, Cl. 220-21.000.

Stelson, Thomas S.: *See*—
Barth, Charles F.; Stelson, Thomas S.; and Blake, David E., 4,295,301, Cl. 51-165.880.

Stemme, Otto; Ruf, Wolfgang; and Wagensonner, Eduard, to AGFA-Gevaert Aktiengesellschaft. Projection and scanning system for producing video signals from motion picture film and control system used therein. 4,296,438, Cl. 358-214.000.

Stephan, Herbert; Aichert, Hans; and Heimerl, Joseph, to Leybold-Heraeus GmbH & Co. KG. Apparatus for the production of high-purity metal powder by means of electron beam heating. 4,295,808, Cl. 425-8.000.

Sterling Drug Inc.: *See*—
Michne, William F., 4,296,238, Cl. 546-97.000.

Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. N-(2,5-Diazolyl)-alkyl-haloacetanilides, compounds and herbicidal compositions. 4,295,876, Cl. 71-90.000.

Stevens, Eric, to Toro Company, The. Snowthrower. 4,295,285, Cl. 37-43.00D.

Stevens, Samuel B., to Caterpillar Tractor Co. Tape brake for tape wrapper. 4,295,916, Cl. 156-397.000.

Stevens, Violete L.: *See*—
Seeburger, Harold O.; Beattie, Ralph G.; and Stevens, Violete L., 4,296,220, Cl. 525-507.000.
Seeburger, Harold O.; Atchison, George J.; and Stevens, Violete L., 4,296,227, Cl. 526-320.000.

Stevie, Robert W., to Innovative Photograhic Enterprises, Inc. Halftone printing system. 4,296,197, Cl. 430-300.000.

Stewart, Alistair B.; and Barker, Ian J., to National Institute for Metallurgy. Control of electrical arc furnaces. 4,296,269, Cl. 13-12.000.

Stewart, Larry: *See*—
Hauk, Ernest D.; and Stewart, Larry, 4,295,526, Cl. 166-315.000.

Stewart, R. Gordon: *See*—
Lynn-Jones, David M.; and Stewart, R. Gordon, 4,295,315, Cl. 52-573.000.

Steyer, William; and Duffy, Robert J., to General Electric Company. Infrared suppressor system. 4,295,332, Cl. 60-264.000.

Stifano, Vincent A., Jr., to Veeder Industries Inc. Tool attachment having spring eject release. 4,295,395, Cl. 81-121.00R.

Stinnes, Wolf W. Winding of fibres. 4,295,917, Cl. 156-428.000.

Stokes, Richard P.; and Stokes, William, to Unlimited Steel Fabricators, Inc. Die for the formation of semi-closed channels or other complex configurations. 4,295,352, Cl. 72-57.000.

Stokes, William: *See*—
Stokes, Richard P.; and Stokes, William, 4,295,352, Cl. 72-57.000.

Stoll, Alois: *See*—
Weissgerber, Rudolf; Stoll, Alois; Kandler, Herbert; Nunner, Hans-Herbert; Eichelseder, Christine; and Pangeri, Helmut, 4,296,017, Cl. 260-30.60R.

Stone, Dale E., to Bell Telephone Laboratories, Incorporated. Resistance detector with delayed hysteresis. 4,296,337, Cl. 307-356.000.

Storey, Richard: *See*—
Drewery, John O.; and Storey, Richard, 4,296,434, Cl. 358-105.000.

Stork, John E., to Speech Technology Corporation. Speech synthesizer. 4,296,279, Cl. 179-1.0SM.

Story, Alfred D.: *See*—
Trimble, Roy L.; Story, Alfred D.; and Martinek, Harold H., 4,295,247, Cl. 17-1.00R.

Stottmann, Richard L.; and Smith, Peter H., to General Electric Company. Apparatus for thawing frozen food in a refrigeration appliance. 4,296,299, Cl. 219-10.810.

Stratabolt Corporation: *See*—
Hansen, Roger M., 4,295,761, Cl. 405-261.000.

Strickland, Hubert E. Auger-equipped plow. 4,295,531, Cl. 172-42.000.

Strickland, William N. Blow-out preventor. 4,295,529, Cl. 166-325.000.

Stroberg, Sven-Olle: *See*—
Hagberg, Gideon, 4,295,969, Cl. 210-223.000.

Strohs, Robert F. Work stand for vertical turbine pumps. 4,295,257, Cl. 29-240.000.

Stroke, Frederick G., to PPG Industries, Inc. Submicron beta silicon carbide powder and sintered articles of high density prepared therefrom. 4,295,890, Cl. 501-90.000.

Stromback, Theodore D. Baseball pitcher's target. 4,295,648, Cl. 273-26.00A.

Stromswold, Chester E.: *See*—
Fuller, Harrison W.; and Stromswold, Chester E., 4,296,389, Cl. 333-160.000.

Stuart-Webb, John, to Imperial Chemical Industries Limited. Aromatic polyethersulphones having —OCH_2COR end groups. 4,296,217, Cl. 525-390.000.

Sturges, Robert H., Jr., to Westinghouse Electric Corp. Photoelectric docking device. 4,295,740, Cl. 356-152.000.

Su, Wen-Shen. Method for removing dust from flue gases. 4,295,865, Cl. 55-84.000.

Suddeutsche Kalkstickstoff-Werke: *See*—
Aignesberger, Alois; Lukas, Walter; and Weinberg, Ekkehard, 4,296,089, Cl. 423-555.000.

Suganuma, Toshio: *See*—
Matsubara, Akira; Sakai, Hideaki; Odate, Makoto; Suganuma, Toshio; and Nakano, Takuo, 4,296,112, Cl. 424-246.000.

Sugata, Yoshiaki; and Miyagawa, Kiyoshi, to Toyoda Koki Kabushiki Kaisha. Workpiece supporting device. 4,295,398, Cl. 82-31.000.

Sugimoto, Kaname, to Hayashibara, Ken. Process for preparing human interferon. 4,296,025, Cl. 260-112.00R.

Sugino, Takashi; and Itoh, Kunio, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser. 4,296,387, Cl. 331-94.50H.

Suginuma, Atsushi: *See*—
Sayo, Kosaku; Suginuma, Atsushi; Tatsumi, Hideo; and Kanamaru, Hisanobu, 4,295,553, Cl. 192-84.00C.

Sugiura, Hitoshi: *See*—
Ishihara, Takeshi; Goto, Daisaku; and Sugiura, Hitoshi, 4,296,276, Cl. 174-179.000.

Sugiyama, Goro. Gas lighter. 4,295,819, Cl. 431-143.000.

Sulzer Brothers Limited: *See*—
Erlach, Hans, 4,295,552, Cl. 192-81.00C.
Meier, Werner, 4,296,050, Cl. 261-112.000.

Sumida, Yasuji: *See*—
Sasaki, Koichi; Sumida, Yasuji; and Ishida, Hiroshi, 4,295,731, Cl. 355-14.00R.

Sumitomo Cement Co., Ltd.: *See*—
Ogawa, Tadashi; Ono, Shunichiro; and Shibuya, Kyoichi, 4,295,823, Cl. 432-106.000.

Sumitomo Chemical Company, Limited: *See*—
Mori, Kenji; and Sasaki, Mitsuru, 4,296,036, Cl. 260-340.700.
Yamaguchi, Takashi; Okuno, Yoshitoshi; and Hirose, Chuji, 4,295,581, Cl. 222-192.000.

Sumitomo Electric Industries, Ltd.: *See*—
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,295,869, Cl. 65-3.110.

Sumitomo Metal Industries, Ltd.: *See*—
Itoh, Koichi; Koshida, Osamu; and Nakayama, Katsuichi, 4,295,354, Cl. 72-225.000.

Sumitomo Naugatuck Co., Ltd.: *See*—
Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, 4,296,216, Cl. 525-66.000.
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masologites, George P., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,295,858, Cl. 44-1.0SR.
Sunroc Corporation: *See*—
Brown, Frank, Jr., 4,295,609, Cl. 239-29.000.
Suponev, Konstantin V.: *See*—
Shopin, Viktor M.; Turenko, Leonid G.; Surovikin, Vitaly F.; and Suponev, Konstantin V., 4,295,867, Cl. 55-288.000.
Surovikin, Vitaly F.: *See*—
Shopin, Viktor M.; Turenko, Leonid G.; Surovikin, Vitaly F.; and Suponev, Konstantin V., 4,295,867, Cl. 55-288.000.
Susumu Sasaki: *See*—
Sasaki, Susumu; Kito, Kyoji; and Koide, Akio, 4,295,855, Cl. 23-230.00B.
Sutrina, Thomas A.; and Behr, R. Douglas, to Dow Chemical Co., The. Forming an integral closure for a thermoplastic container. 4,295,919, Cl. 156-498.000.
Suzuki, Hajime; and Iwano, Yoshimi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Detection of weft in shuttleless loom. 4,295,499, Cl. 139-370.200.
Suzuki, Kinzo: *See*—
Sendo, Masaaki; and Suzuki, Kinzo, 4,296,063, Cl. 264-273.000.
Suzuki, Miyo: *See*—
Nakanishi, Toshiharu; Suzuki, Miyo; and Ohigashi, Hiroji, 4,296,349, Cl. 310-335.000.
Suzuki, Takashi; Sawada, Hidekazu; and Katamoto, Kazuyoshi, to Takeda Chemical Industries, Ltd. Mildiomycin analogs and a method of production. 4,296,107, Cl. 424-180.000.
Svaty, Vladimir, to Zbrojovka Vsetin. Method of and a device for forming an additional stream of air in a guide comb of an air jet loom. 4,295,500, Cl. 139-435.000.
Svelto, Francesco: *See*—
Mezzetti, Sergio; Pizzolati, Pierluigi; and Svelto, Francesco, 4,296,318, Cl. 250-225.000.
Svitak, John J.: *See*—
Doten, Bradford O.; and Svitak, John J., 4,295,596, Cl. 228-180.00A.
Swales, Danvers A.; and Marshall, Michael A., to British Chrome & Chemicals Ltd. Chromic oxide production. 4,296,076, Cl. 423-53.000.
Swassek, Gunter: *See*—
Nelle, Gunther; and Swassek, Gunter, 4,295,742, Cl. 356-373.000.
Swenson, Paul F. Heating system. 4,295,606, Cl. 237-12.100.
Swift, Edward R., Jr.; and Schmuck, Philip W., to Baker International Corporation. Method and apparatus for quick replacement of cartridge filters used in well fluid cleaning operations. 4,295,525, Cl. 166-312.000.
Swiss Aluminium Ltd.: *See*—
Lajh, Rajko, 4,295,883, Cl. 75-68.00R.
Sygnator, Henry A.: *See*—
Bjorklund, Lowell L.; Berg, Ramon A.; and Sygnator, Henry A., 4,295,351, Cl. 72-38.000.
Syntex (U.S.A.) Inc.: *See*—
Muchowski, Joseph M.; and Venuti, Michael C., 4,296,042, Cl. 260-345.90R.
Szarka, David D.: *See*—
Baker, Eugene E.; and Szarka, David D., 4,295,524, Cl. 166-278.000.
Szczepanski, Slawomir Z. Vehicle anti-theft device. 4,296,402, Cl. 340-64.000.
Szente, Andre: *See*—
Fischli, Albert E.; and Szente, Andre, 4,296,031, Cl. 260-239.30D.
Tabei, Masatoshi: *See*—
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.
Tachibana, Keiji; Nakayama, Yoshihiko; Kaneko, Junichi; and Ishii, Susumu, to Hitachi, Ltd. Apparatus for controlling operation of fluid pressure raising system. 4,295,792, Cl. 417-15.000.
Tada, Isao: *See*—
Fukatsu, Akihiro; and Tada, Isao, 4,296,355, Cl. 315-39.510.
Taiho Kogyo Co., Ltd.: *See*—
Iwahana, Keiiti; Mathuda, Yoshimi; and Futamura, Kenichiro, 4,296,183, Cl. 428-653.000.
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, to Richter Gedeon Vegyeszeti Gyar. Apparatus for the treatment of wet solids, especially pulpy materials, by heating or cooling. 4,296,072, Cl. 422-254.000.
Takagi, Sadaaki. Method for production of polyurethane cushion material. 4,296,054, Cl. 264-45.300.
Takahashi, Akio; Itoh, Yutaka; Wajima, Motoyo; Morishita, Hirosada; and Nishikawa, Akio, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Bismide-ether compounds, compositions thereof, and method of producing same. 4,296,219, Cl. 525-488.000.
Takahashi, Akira; and Oohashi, Kenichi, to Kabushiki Kaisha Osaka Packing Seizosho. Alumina-containing calcium silicate and process for producing same. 4,295,893, Cl. 106-120.000.
Takahashi, Itaru: *See*—
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Takahashi, Soji: *See*—
Imai, Kuninori; and Takahashi, Soji, 4,295,595, Cl. 228-161.000.
Takara Co., Ltd.: *See*—
Fukui, Osamu, 4,295,291, Cl. 46-161.000.
Takashi, Uchiyama; Tsunekawa, Tokuichi; and Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Camera for daylight and flash photography. 4,295,722, Cl. 354-146.000.
Takatori, Yasushi: *See*—
Hara, Toshitami; Sato, Yasushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,296,421, Cl. 346-140.00R.
Takeda Chemical Industries, Ltd.: *See*—
Ogino, Fumiichi, 4,296,166, Cl. 428-283.000.
Suzuki, Takashi; Sawada, Hidekazu; and Katamoto, Kazuyoshi, 4,296,107, Cl. 424-180.000.
Takeuchi, Kiyoyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Film containing magazine. 4,295,565, Cl. 206-455.000.
Takeuchi, Minami; and Kuriki, Minoru, to Tokyo Shibaura Electric Co., Ltd. Reverse conducting amplified gate thyristor with plate-like separator section. 4,296,427, Cl. 357-39.000.
Takezaki, Tsuneo, to Matsushita Electric Industrial Company. Level indicator for indication of maximum values. 4,296,375, Cl. 324-103.00P.
Takikawa, Yoshio: *See*—
Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, 4,296,346, Cl. 310-242.000.
Talres Development (N.A.) N.V.: *See*—
Khan, Riaz A.; and Jenner, Michael R., 4,296,139, Cl. 426-536.000.
Tanaka, Chiaki: *See*—
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.
Tanaka, Haruo: *See*—
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Tanaka, Hiromitsu: *See*—
Enomoto, Satoru; Asano, Kiro; and Tanaka, Hiromitsu, 4,296,233, Cl. 536-5.000.
Tanaka, Hironari; Matsuyama, Shigeru; Ishibashi, Tadashi; Kinugawa, Kiyoshige; and Sato, Yukihiro, to Hitachi, Ltd. Liquid crystal display device. 4,295,711, Cl. 350-334.000.
Tanaka, Kenji; and Endo, Shigeru, to Nisshin Flour Milling Co., Ltd. Method for producing bread. 4,296,133, Cl. 426-23.000.
Tanaka, Naoki; Tsuchiya, Kunihiko; and Nishizawa, Toshizo, to Mitsubishi Denki Kabushiki Kaisha. Rotary compressor with wire gauge lubricant separator. 4,295,806, Cl. 418-97.000.
Tanaka, Shigeyoshi: *See*—
Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, 4,295,947, Cl. 204-159.150.
Tang, David Y.; and Foster, Arthur M., to Hooker Chemicals & Plastics Corp. (3-Trifluoromethylphenyl)-alpha-hydroxyacetic acid and process for preparation. 4,296,244, Cl. 562-470.000.
Taniguchi, Hiroyoshi: *See*—
Hasegawa, Haruo; Taniguchi, Hiroyoshi; and Igawa, Takao, 4,296,190, Cl. 430-57.000.
Tano, Kazuhiro: *See*—
Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, 4,296,145, Cl. 427-47.000.
Tapeswitch Corporation of America: *See*—
Koenig, Robert H.; and D'Angelo, Victor, 4,296,283, Cl. 200-16.00D.
Tarnblom, Stig: *See*—
Malmgren, Nils-Gunnar; Solly, Barry; and Tarnblom, Stig, 4,295,900, Cl. 148-12.00B.
Tatham, Jack R.; and Shelor, Jerry L., to Phillips Petroleum Company. Method for controlling edge uniformity in nonwoven fabrics. 4,295,251, Cl. 28-112.000.
Tatis Plasttatningar AB: *See*—
Dahlberg, Anders, 4,295,311, Cl. 52-396.000.
Tatsumi, Hideo: *See*—
Sayo, Kosaku; Suginuma, Atsushi; Tatsumi, Hideo; and Kanamaru, Hisanobu, 4,295,553, Cl. 192-84.00C.
Taylor, Clyde G.: *See*—
Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., 4,296,159, Cl. 428-95.000.
Taylor, Leslie L., Jr.: *See*—
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.
Taylor, Raymond C.: *See*—
Richards, Frank P.; and Taylor, Raymond C., 4,295,838, Cl. 493-105.000.
TDK Electronics Co., Ltd.: *See*—
Toda, Kohji, 4,296,348, Cl. 310-334.000.
Teegarden, Derylle L.: *See*—
Penn, Eric J.; and Teegarden, Derylle L., 4,295,258, Cl. 29-283.000.
Teepak, Inc.: *See*—
Trimble, Roy L.; Story, Alfred D.; and Martinek, Harold H., 4,295,247, Cl. 17-1.00R.
Teetz, Wolfgang: *See*—
Desprez, Alfred; Sauerland, Heinz; and Teetz, Wolfgang, 4,295,433, Cl. 112-241.000.
Teichmann, Paul: *See*—
Beneke, Wolfgang; and Teichmann, Paul, 4,295,248, Cl. 19-113.000.
Teijin Limited: *See*—
Emi, Shingo; and Saiki, Noritsugu, 4,296,163, Cl. 428-212.000.
Hara, Shigeyoshi; and Yamada, Tateyoshi, 4,296,218, Cl. 525-439.000.

Teijin Seiki Company, Limited: *See—*
Kamimura, Toshio, 4,295,413, Cl. 92-5.00L.
Tektronix, Inc.: *See—*
Hofer, Bruce E., 4,296,381, Cl. 330-149.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Jeandot, Jean-Louis; and Lefort, Emmanuel, 4,296,383, Cl. 330-301.000.
Tellis, Cyril B. Separation of hydrogen chloride from gaseous mixtures. 4,296,078, Cl. 423-240.000.
Temme, Karl: *See—*
Walther, Carl K.; and Temme, Karl, 4,295,300, Cl. 51-163.200.
Temple, John W., Jr. Corrosion resistant fastener. 4,295,767, Cl. 411-377.000.
Tennant Company: *See—*
Bricher, Charles W.; and Herpers, Ferdinand J., 4,295,274, Cl. 30-347.000.
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,295,244, Cl. 15-320.000.
Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, to Kokusai Denshin Denwa Co., Ltd. Digital signal control system in a facsimile communication. 4,296,439, Cl. 358-257.000.
Teranishi, Katsuya: *See—*
Saito, Cyuichi; and Teranishi, Katsuya, 4,295,556, Cl. 198-325.000.
Teranuma, Jun: *See—*
Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, 4,295,455, Cl. 123-569.000.
Terao, Motoyasu; Shigematsu, Kazuo; Ojima, Masahiro; and Yonezawa, Seiji, to Hitachi, Ltd. Member for recording information. 4,296,419, Cl. 346-135.100.
Terrell Machine Company, The: *See—*
Niederer, Kurt W., 4,295,569, Cl. 209-634.000.
Terry Corporation: *See—*
Dussourd, Jules L.; and Pfannebecker, George W., 4,295,788, Cl. 415-202.000.
Terry, Robert R.; and Boone, Jacob J., to Nordson Corporation. Method of obtaining a seal upon the interior surface of a container closure and resulting product. 4,295,573, Cl. 215-348.000.
Tew, William: *See—*
Smith, Leslie; Tew, William; and Woolley, Jack, 4,296,458, Cl. 361-433.000.
Texaco Inc.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,296,213, Cl. 521-166.000.
Gass, John C.; Kerr, Noell C.; and Pittmann, Robert W., 4,295,795, Cl. 417-111.000.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J.; Lowell, Victor; and Whipple, Elliot, 4,296,287, Cl. 200-83.00P.
Garcia, Felix, Jr.; Hergert, Roger A.; Mann, Don C.; and Brown, Sheldon H., 4,296,448, Cl. 360-135.000.
Penn, Thomas C., 4,296,146, Cl. 427-58.000.
Rogers, Gerald D., 4,295,264, Cl. 29-571.000.
Tubbs, Graham S.; and Ponder, James E., 4,295,897, Cl. 148-1.500.
Weirauch, Donald F., 4,296,347, Cl. 310-313.00B.
Texasgulf Inc.: *See—*
Saville, James, 4,295,881, Cl. 75-10.00R.
Textron Inc.: *See—*
DeCaro, Charles J., 4,295,394, Cl. 81-57.370.
Th. Kieserling & Albrecht: *See—*
Schweer, Wilhelm, 4,295,397, Cl. 82-20.000.
Thaxter, James B., to Sperry Corporation. Magnetic toner apparatus. 4,295,442, Cl. 118-657.000.
Thermoplastics, Inc.: *See—*
Grote, Daniel; Raymond, Duane; and Mosher, Joseph C., 4,295,262, Cl. 29-462.000.
Theta-Corporation: *See—*
Rodriguez, Edward T., 4,296,331, Cl. 250-551.000.
Theurer, Josef; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machine for removing surface irregularities from rail heads. 4,295,764, Cl. 409-296.000.
Thiokol Corporation: *See—*
Adams, Gary V.; and Schneiter, Fred E., 4,296,084, Cl. 423-351.000.
Thizy, Andre; Poignant, Pierre; and Pillon, Daniel, to Philagro. Selective herbicidal method in cotton and soybeans. 4,295,877, Cl. 71-120.000.
Thomas & Betts Corporation: *See—*
Narozny, Ronald S.; and Wyss, Robert P., 4,295,704, Cl. 339-99.00R.
Thomas De La Rue & Company Limited: *See—*
Haslop, John M.; Knapman, Reginald G.; and West, Michael A., 4,296,326, Cl. 250-372.000.
Thomas, James R.: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.
Thomas, James S., to Motorola, Inc. Power on and low voltage reset circuit. 4,296,338, Cl. 307-362.000.
Thomas, Rudolf: *See—*
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.
Thompson, John R.: *See—*
Robinson, Bruce A.; and Thompson, John R., 4,295,252, Cl. 28-248.C0.
Thomson-Brandt: *See—*
Rilly, Gerard, 4,296,360, Cl. 315-387.000.
Thomson CSF: *See—*
Bursztejn, Jacques, 4,296,495, Cl. 371-22.000.
Gilles, Jean, 4,296,426, Cl. 357-23.000.
Lacombat, Michel; and Gerard, Andre, 4,295,735, Cl. 355-43.000.
Thomson, George M.; and Jamison, Keith A., to United States of America, Army. Flowing gas discharge source of vacuum ultra-violet line radiation system. 4,296,330, Cl. 250-504.00R.
Thorington, Luke: *See—*
Trutner, Donald G.; and Thorington, Luke, 4,295,873, Cl. 65-108.000.
Thunker, Norbert, to Heidelberger Druckmaschinen Aktiengesellschaft. Camless drive of a swinging pre-gripper feeder. 4,295,422, Cl. 101-232.000.
Thuzimoto, Shigenori: *See—*
Okumichi, Toshiharu; Oseto, Osamu; Matsumoto, Keizo; Thuzimoto, Shigenori; and Sanda, Hisanari, 4,296,012, Cl. 260-29.6XA.
Tijburg, Rudolf P.; de Waard, Peter J.; and van Dongen, Teunis, to U.S. Philips Corporation. Semiconductor injection laser having a movable laser beam. 4,296,386, Cl. 331-94.50H.
Timex Corporation: *See—*
Wilson, Robert, 4,295,516, Cl. 164-464.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, 4,295,809, Cl. 425-72.00S.
TOA Valve Co. Ltd.: *See—*
Hagihara, Noboru, 4,296,307, Cl. 219-121.0ED.
Tochio, Yoshihiko: *See—*
Yoshida, Masakatsu; Tochio, Yoshihiko; and Tohi, Atsutomo, 4,295,898, Cl. 148-1.500.
Toda, Kohji, to TDK Electronics Co., Ltd., a part interest. Interdigitated electrode ultrasonic transducer. 4,296,348, Cl. 310-334.000.
Tohi, Atsutomo: *See—*
Yoshida, Masakatsu; Tochio, Yoshihiko; and Tohi, Atsutomo, 4,295,898, Cl. 148-1.500.
Tohzuka, Takashi: *See—*
Ohsaka, Yohnosuke; and Tohzuka, Takashi, 4,296,265, Cl. 570-138.000.
Tokuda, Kuniaki: *See—*
Kasahara, Shizuka; Yamanishi, Kazuhiko; Hanada, Toshiro; Tokuda, Kuniaki; and Kobatake, Shinzo, 4,295,853, Cl. 23-230.00B.
Tokyo Juki Industrial Co., Ltd.: *See—*
Uemura, Tamio; Ito, Yoshimasa; and Itakura, Takahiro, 4,295,435, Cl. 112-322.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hirata, Akio, 4,296,367, Cl. 318-808.000.
Takeuchi, Kiyoyuki, 4,295,565, Cl. 206-455.000.
Tsuji, Shigeo; and Aikawa, Takahisa, 4,296,316, Cl. 250-204.000.
Yanabu, Satoru; Mizoguchi, Hitoshi; and Simogawara, Naoaki, 4,296,288, Cl. 200-146.00R.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,296,065, Cl. 264-325.000.
Takeuchi, Minami; and Kuriki, Minoru, 4,296,427, Cl. 357-39.000.
Tolliver, Wilbur E. Variegated stirrup mat. 4,295,497, Cl. 138-175.000.
Tolliver, Wilbur E. Spacer bar and related method for concrete pipe manufacture. 4,295,501, Cl. 140-92.100.
Tomaro, Patrick M., deceased (by Tomaro, Rita, executrix), to Conair Corporation. Air diffuser for a hair dryer. 4,295,283, Cl. 34-97.000.
Tomaro, Rita, executrix: *See—*
Tomaro, Patrick M., deceased, 4,295,283, Cl. 34-97.000.
Tomic, Dobrivoje. Material as spongiosacement with effervescent reabsorptive effect. 4,296,209, Cl. 521-85.000.
Tominaga, Akira, to Kansai Paint Co., Ltd. Resin composition for cationic electrodepositing paints. 4,296,010, Cl. 260-29.2TN.
Tomisawa, Setsuo: *See—*
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,296,123, Cl. 424-287.000.
Tomov, Nenad R.; and Roberts, Geoffrey M., to Diamond Shamrock Technologies S.A. Process for the electrolytic production of manganese dioxide. 4,295,943, Cl. 204-96.000.
Tomy Kogyo Co., Inc.: *See—*
Konta, Yukic, 4,295,651, Cl. 273-121.00D.
Toray Industries, Inc.: *See—*
Nakanishi, Toshiharu; Suzuki, Miyo; and Ohigashi, Hiroji, 4,296,349, Cl. 310-335.000.
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.
Tordoff, William L., to Ashland Oil, Inc. Automatic cone and mold-making machine. 4,295,515, Cl. 164-158.000.
Toro Company, The: *See—*
Stevens, Eric, 4,295,285, Cl. 37-43.00D.
Torregrossa, Louis O.: *See—*
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,925, Cl. 162-19.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,926, Cl. 162-57.000.

Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,927, Cl. 162-57.00.

Torzala, Terence A., to Air Shields, Inc. Probe and system for detecting probe dislodgement. 4,295,475, Cl. 128-736.000.

Toshiba Corporation: *See—*
Fukatsu, Akihiro; and Tada, Isao, 4,296,355, Cl. 315-39.510.
Kohyama, Mitsuaki, 4,295,443, Cl. 118-657.000.

Toshin Kogyo Co. Ltd.: *See—*
Yoshikawa, Takaharu, 4,296,365, Cl. 318-632.000.

Toti, Gabriele; Lenzi, Giuliano; and Monti, Paolo, to Alfa Romeo S.p.A. Active suspensions assembly for a motor car. 4,295,660, Cl. 280-714.000.

Toulan, Roy D., Jr.: *See—*
Dennesen, Francis G.; Wilson, Richard S.; Toulan, Roy D., Jr.; and Madnick, Peter. 4,295,277, Cl. 33-181.00R.

Towmotor Corporation: *See—*
Hildebrecht, Harold V., 4,295,540, Cl. 180-271.000.
Malecha, Richard J., 4,295,541, Cl. 180-315.000.

Toyo Kogyo Co., Ltd.: *See—*
Iida, Yoshihiko, 4,295,454, Cl. 123-556.000.

Toyo Seikan Kaisha Limited: *See—*
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, 4,296,182, Cl. 428-629.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Satoh, Takao; and Seita, Toru, 4,295,944, Cl. 204-98.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Sugata, Yoshiaki; and Miyagawa, Kiyoshi, 4,295,398, Cl. 82-31.000.

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Toyoshima, Shigeru: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nomura, Etsuji; Matsui, Kazuma; Miyazaki, Toshikuni; Sami, Hiroshi; and Ueda, Tatehito, 4,295,456, Cl. 123-569.000.
Shibatani, Juichi; Nakamura, Kenichi; Izuhara, Wataru; and Obu, Yuichiro, 4,295,549, Cl. 188-218.00A.

Tracor, Inc.: *See—*
Anderson, Rollen J., 4,295,856, Cl. 23-232.00E.

Trautweiler, Franz, to Ciba-Geigy AG. Photographic process using a thin flexuous layer and reflective layer. 4,296,198, Cl. 430-403.000.

Travnicek, Jiri: *See—*
Kupf, Lubomir; Travnicek, Jiri; Adamek, Radomil; and Kyzlink, Josef, 4,295,628, Cl. 249-80.000.

Tredennick, Harry L.: *See—*
Gunter, Thomas G.; Tredennick, Harry L.; and McAlister, Doyle V., 4,296,469, Cl. 364-200.000.

Tri/Valley Growers: *See—*
Jaquith, Jack B.; and Church, Allen R., 4,296,140, Cl. 426-575.000.

Trimble, John: *See—*
McGowan, John B.; and Trimble, John, 4,295,494, Cl. 138-89.000.

Trimble, Roy L.; Story, Alfred D.; and Martinek, Harold H., to Teepak, Inc. Gripper-separator device for continuously shirred casings. 4,295,247, Cl. 17-1.00R.

Trishevsky, Igor S.: *See—*
Anisimov, Vyacheslav I.; Bulgakov, Evgeny G.; Gurin, Vasily N.; Radjukevich, Leonid V.; Trishevsky, Igor S.; Trishevsky, Oleg I.; Kheifets, Grigory R.; and Jurchenko, Anatoly B., 4,295,353, Cl. 72-180.000.

Trishevsky, Oleg I.: *See—*
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Trouet, Andre B. L.: *See—*
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Trutner, Donald G.; and Thorington, Luke, to Duro-Test Corporation. Method and apparatus for reworking a hollow workpiece. 4,295,873, Cl. 65-108.000.

Trutzschler GmbH & Co. KG: *See—*
Beneke, Wolfgang; and Teichmann, Paul, 4,295,248, Cl. 19-113.000.

TRW Inc.: *See—*
Barth, Charles F.; Stelson, Thomas S.; and Blake, David E., 4,295,301, Cl. 51-165.880.
Harrington, Alan L.; Rodov, Vladimir; and Allison, Richard, 4,295,267, Cl. 29-571.000.
Richardson, Warren N., 4,296,286, Cl. 200-61.540.

Trzeciak, Kurt M.: *See—*
Crase, Gary M.; and Trzeciak, Kurt M., 4,295,535, Cl. 175-101.000.

Tsang, Floris Y.: *See—*
Anand, Joginder N.; Revak, Timothy T.; and Tsang, Floris Y., 4,296,052, Cl. 264-25.000.

Tsuchida, Kensaku; and Karasawa, Shinji, to Matsushita Electric Industrial Co., Ltd. Method for making intercell connections in multi-cell storage battery. 4,296,303, Cl. 219-78.130.

Tsuchida, Yasuhiro: *See—*
Kuraoka, Yasuo; and Tsuchida, Yasuhiro, 4,295,339, Cl. 62-64.000.

Tsuchiya, Kunihiko: *See—*
Tanaka, Naoki; Tsuchiya, Kunihiko; and Nishizawa, Toshizo, 4,295,806, Cl. 418-97.000.

Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, to Olympus Optical Company Ltd. Filter assembly for collecting used toner of electrophotographic copying machine. 4,295,734, Cl. 355-15.000.

Tsuge, Akihiko: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,296,065, Cl. 264-325.000.

Tsuji, Setsuo: *See—*
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.

Tsuji, Shigeo; and Aikawa, Takahisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical focusing device. 4,296,316, Cl. 250-204.000.

Tsunekawa, Tokuichi: *See—*
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Tsuneta, Kazuyoshi: *See—*
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Tu, Hosheng, to UOP Inc. Attenuation of metal contaminants on cracking catalyst with a boron compound. 4,295,955, Cl. 208-120.000.

Tubbs, Graham S.; and Ponder, James E., to Texas Instruments Incorporated. Method of making CMOS integrated circuit device. 4,295,897, Cl. 148-1.500.

Tucker, Samuel M.: *See—*
McAvinn, James D.; Meister, Arthur R.; and Tucker, Samuel M., 4,295,537, Cl. 177-15.000.

Turchetti, Gianni: *See—*
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Turco, Vincenzo L.: *See—*
Genco, Vito; and Turco, Vincenzo L., 4,295,426, Cl. 102-451.000.

Turenko, Leonid G.: *See—*
Shopin, Viktor M.; Turenko, Leonid G.; Surovikin, Vitaly F.; and Suponev, Konstantin V., 4,295,867, Cl. 55-288.000.

Turner, Robert B.: *See—*
Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., 4,296,159, Cl. 428-95.000.

Turner, Thomas O.: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.

Tutty, Geoffrey C., to INCA Limited. Image wise developable system. 4,295,662, Cl. 282-27.500.

Tyco Industries, Inc.: *See—*
Brand, Derek A.; and Brand, Derek R., 4,295,295, Cl. 46-259.000.

Tyco Laboratories: *See—*
Blincow, Donald W.; Cassedy, Kevin H.; and Dominey, Samuel C., Jr., 4,296,321, Cl. 250-254.000.

Tyler Refrigeration Corporation: *See—*
Abraham, Fayez F., 4,295,340, Cl. 62-82.000.

Uchida, Sakae, to Setagayaseiki Co. Ltd. Motorized dental handpiece. 4,295,830, Cl. 433-115.000.

Udayasekaran, Rajasekaran, to Northern Telecom Limited. Static, solid state originating register compatible with an electromechanical telephone cross-bar switching system. 4,296,281, Cl. 179-18.0EB.

Ueda, Hideo: *See—*
Kawamura, Toshio; Harashima, Noboru; Ueda, Hideo; and Sano, Seijiro, 4,295,654, Cl. 277-92.000.

Ueda, Tatehito: *See—*
Nomura, Etsuji; Matsui, Kazuma; Miyazaki, Toshikuni; Sami, Hiroshi; and Ueda, Tatehito, 4,295,456, Cl. 123-569.000.

Uemura, Tamio; Ito, Yoshimasa; and Itakura, Takahiro, to Tokyo Juki Industrial Co., Ltd. Cloth feed apparatus. 4,295,435, Cl. 112-322.000.

Ueno, Hiroshi: *See—*
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, 4,296,182, Cl. 428-629.000.

Uerdingen, Walter: *See—*
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UMAC, Inc.: *See—*
McGowan, John B.; and Trimble, John, 4,295,494, Cl. 138-89.000.

Umezawa, Hamao; Okami, Yoshiro; and Kondo, Shinichi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Istamycins and production thereof. 4,296,106, Cl. 424-181.000.

Umezawa, Kazushige: *See—*
Arima, Ryoji; Umezawa, Kazushige; and Nisugi, Tokuzo, 4,295,882, Cl. 75-52.000.

Ungermann, Dieter: *See—*
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Union Carbide Corporation: *See—*
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Maresca, Louis M.; Gill, Peter J.; and Berger, Mitchell H., 4,296,232, Cl. 528-179.000.
Vasudevan, Ganapathy; and Lustig, Stanley, 4,296,142, Cl. 427-28.000.

Union Oil Company of California: *See—*
Dhondt, Roland O., 4,295,773, Cl. 414-187.000.

Union Special Corporation: *See—*
Hsiao, James C., 4,295,434, Cl. 112-314.000.

United States Gypsum Company: *See—*
Nelson, David M., 4,295,299, Cl. 49-504.000.

United States of America
Agriculture: *See—*
Camirand, Wayne M.; Randall, John M.; and Hautala, Earl, 4,295,333, Cl. 60-641.600.
America: *See—*
Angwin, Meredith J.; Pfefferle, William C.; and Kesselring, John P., 4,295,818, Cl. 431-7.000.
Simons, S. Stoney, Jr., 4,296,206, Cl. 435-240.000.
Army: *See—*
F'Geppert, Erwin, 4,295,750, Cl. 403-259.000.
Oswell, Herman R., 4,295,617, Cl. 244-3.290.
Thomson, George M.; and Jamison, Keith A., 4,296,330, Cl. 250-504.00R.
Zura, Boris, 4,295,379, Cl. 73-862.620.
Energy: *See—*
Cookson, Alan H., 4,296,274, Cl. 174-142.000.
Franks, Larry A.; and Nelson, Melvin A., 4,296,319, Cl. 250-227.000.
Health and Human Services: *See—*
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Paice, Derek A.; and Shimp, Alan B., 4,296,450, Cl. 361-50.000.
National Aeronautics and Space Administration: *See—*
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Navy: *See—*
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Green, Milton, 4,296,487, Cl. 367-169.000.
Haberl, John B., 4,296,345, Cl. 310-219.000.
Klein, Philipp H.; Addamiano, Arrigo; and Allen, Roger, 4,295,989, Cl. 252-301.40F.
Sergev, Sergius S.; and Roster, Theodore J., 4,295,604, Cl. 236-21.00R.

U.S. Philips Corporation: *See—*
Bodart, Robert; and Werts, Jean P. A. R. J., 4,296,493, Cl. 370-48.000.
Degger, Wolter W. J.; and Van Kasteren, Adrianus C., 4,295,625, Cl. 248-466.000.
Franken, Adrianus J. J.; Khoe, Giok D.; and Kuppers, Dieter, 4,296,143, Cl. 427-38.000.
Geurts, Martinus F. A. M., 4,296,437, Cl. 358-173.000.
Nederlof, Leendert; and Salters, Roelof H. W., 4,296,475, Cl. 364-900.000.
Tijburg, Rudolf P.; de Waard, Peter J.; and van Dongen, Teunis, 4,296,386, Cl. 331-94.50H.

United Technologies Corporation: *See—*
Licht, Lazar, 4,295,689, Cl. 308-9.000.
Manning, Frank B., 4,295,784, Cl. 415-162.000.
Melanson, Donald G., 4,295,666, Cl. 285-14.000.
Meltz, Gerald; and Snitzer, Elias, 4,295,738, Cl. 356-32.000.
Meltz, Gerald; and Snitzer, Elias, 4,295,739, Cl. 356-43.000.
Moffatt, E. Marston, 4,295,373, Cl. 73-505.000.
Palma, Gary E.; and Mottier, Francois M., 4,295,741, Cl. 356-349.000.
Rannenberg, George C., 4,295,518, Cl. 165-2.000.
Wynosky, Thomas A.; and Campbell, Charles A., 4,295,611, Cl. 239-265.370.

University of Minnesota, The Regents of the: *See—*
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Unlimited Steel Fabricators, Inc.: *See—*
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UOP Inc.: *See—*
Antos, George J., 4,295,959, Cl. 208-138.000.
Antos, George J., 4,295,960, Cl. 208-139.000.
Benson, Henry E.; and Moravec, Terrence D., 4,295,918, Cl. 156-434.000.
Carlson, David H. J., 4,295,993, Cl. 252-430.000.
Carson, Don B., 4,296,261, Cl. 568-890.000.
Childs, Michael E., 4,295,860, Cl. 44-63.000.
Graves, Kevin, 4,295,627, Cl. 248-588.000.
Gregory, Leslie A., 4,295,681, Cl. 297-284.000.
Kulprathipanja, Santi, 4,295,994, Cl. 252-430.000.
Tu, Hosheng, 4,295,955, Cl. 208-120.000.

Upchurch, Lonnie W., to Advanced Marine Concepts, Inc. Pontoon boat. 4,295,236, Cl. 9-2.00S.

Upjohn Company, The: *See—*
Axen, Udo F.; and Sih, John C., 4,296,253, Cl. 564-153.000.
Ewen, James H.; and McClellan, Thomas R., 4,296,212, Cl. 521-163.000.
Hester, Jackson B., Jr., 4,296,239, Cl. 546-271.000.
Sih, John C., 4,296,041, Cl. 260-345.200.
Sih, John C., 4,296,246, Cl. 562-503.000.
Sih, John C., 4,296,247, Cl. 562-503.000.
Sih, John C., 4,296,248, Cl. 562-503.000.
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Sih, John C., 4,296,250, Cl. 562-503.000.
Sih, John C., 4,296,256, Cl. 568-330.000.

USM Corporation: *See—*
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Vacmetal Gesellschaft fur Vakuum-Metallurgie mbH: *See—*
Zahs, Gernot; and Wahle, Hans-Jurgen, 4,295,667, Cl. 285-18.000.

Vaeth, Guenter: *See—*
Rudolf, Peter; Steck, Werner; Jakusch, Helmut; Vaeth, Guenter; and Jaeckh, Christof, 4,296,149, Cl. 427-130.000.

Valembois, Pierre V.: *See—*
Maby, Edward W.; Kawamoto, Hirohisa; and Valembois, Pierre V., 4,296,144, Cl. 427-38.000.

Vanderheyden, Eric E.; and Casciotti, Albert, to AMP Incorporated. Solderless filter mounting for header assemblies. 4,296,390, Cl. 333-182.000.

van der Meulen, Leonard. Device for stacking thin-walled bags. 4,295,644, Cl. 270-60.000.

van Dongen, Teunis: *See—*
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Van Kasteren, Adrianus C.: *See—*
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Van Linge, Douwe J.: *See—*
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Van Ness, Bradford O.: *See—*
Weimer, Dan G.; and Van Ness, Bradford O., 4,296,315, Cl. 235-460.000.

Van Riessen, Huibert A.: *See—*
Ladage, Cornelis A.; Van Linge, Douwe J.; and Van Riessen, Huibert A., 4,296,131, Cl. 424-347.000.

VanTielen, Willem R. Modular tower and method of constructing same. 4,295,317, Cl. 52-637.000.

Varian Associates, Inc.: *See—*
Griesenauer, Neal M.; and Gersi, Julius J., 4,296,178, Cl. 428-462.000.
Neubauer, Michael L., 4,296,354, Cl. 315-3.500.
Welch, Kimo M., 4,295,338, Cl. 62-55.500.

Varma, Brajendra P., to Eltra Corporation. Method for battery plate. 4,295,940, Cl. 204-2.100.

Vas, Ran: *See—*
Diamond, George; Forrester, James; Hirsch, Michael; and Vas, Ran, 4,295,473, Cl. 178-695.000.

Vasilantone, Michael. Infrared dryer. 4,295,826, Cl. 432-185.000.

Vasile, Carmine F., to Rockwell International Corporation. Shielded electromagnetic acoustic transducers. 4,296,486, Cl. 367-140.000.

Vasudevan, Ganapathy; and Lustig, Stanley, to Union Carbide Corporation. Method for coating a tubular food casing. 4,296,142, Cl. 427-28.000.

Vaughan, Thomas W.: *See—*
Etzold, Roland; Impellizzeri, Julius S.; and Vaughan, Thomas W., 4,295,557, Cl. 198-382.000.

VDO Adolf Schindling AG: *See—*
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VEB Kombinat Polygraph "Werner Lamberz": *See—*
Johne, Hans; Muller, Wolfgang; Jentzsch, Arndt; and Schumann, Gunter, 4,295,423, Cl. 101-349.000.

Veeder Industries Inc.: *See—*
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Veit Dennert KG Baustoffbetriebe: *See—*
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Venuti, Michael C.: *See—*
Muchowski, Joseph M.; and Venuti, Michael C., 4,296,042, Cl. 260-345.90R.

Verbeek, Antonie E.; and Mattheij, Jozef M. J., to J. T. Baker Chemicals B.V. Reagent for the quantitative determination of water. 4,295,990, Cl. 252-408.000.

Vereczkey, Endre: *See—*
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, 4,296,072, Cl. 422-254.000.

Verma, Dharmvir S. Cell culture and continuous dialysis flask and method. 4,296,205, Cl. 435-240.000.

Vibronek, Robert D.: *See—*
Comizzoli, Robert B.; and Vibronek, Robert D., 4,296,370, Cl. 324-54.000.

Vicik, Stephen J.: *See—*
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Vickers Limited: *See—*
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Victoreen, Inc.: *See—*
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Viklund, Ake E., to Aktiebolaget Electrolux. Knocked-down cabinet. 4,295,693, Cl. 312-257.00R.

Villani, Frank: *See—*
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Vincek, Robert C., to Becton, Dickinson and Company. Air-evacuated package with vacuum integrity indicator means. 4,295,566, Cl. 206-457.000.

Vinings Chemical Company: *See—*
Hauser, H. William, 4,296,079, Cl. 423-242.000.

Visconti, James. Simulated gem. 4,295,347, Cl. 63-32.000.

Vock, Manfred H.: *See—*
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,295,978, Cl. 252-8.900.

Voest-Alpine Aktiengesellschaft: *See—*
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Vogel, William D.: *See—*
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Vogler, Lynda L.: *See—*
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Voirol, Felix: *See—*
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Voith Getriebe KG.: *See—*
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Volkswagenwerk Aktiengesellschaft: *See—*
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Zimmermann, Frank; Heidemeyer, Paulus; and Bigalke, Erhard, 4,295,551, Cl. 192-0.076.

Vollett, Eric M., to Holset Engineering Company Limited. Torsional vibration dampers. 4,295,546, Cl. 188-378.000.

Volterra, Giovanna: *See—*
Ghelardoni, Mario; Pestellini, Vittorio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,296,124, Cl. 424-285.000.

Volz, Roland: *See—*
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von Hellens, C. Robert: *See—*
Moore, Arlan G., 4,295,656, Cl. 280-87.04A.

Vorwerk & Sohn GmbH & Co. KG.: *See—*
Stein, Hermann, 4,295,509, Cl. 152-158.000.

Voss, Clifford C. Collapsible shelter. 4,295,446, Cl. 119-19.000.

Voss, Wilfried: *See—*
Finsterwalder, Kurt; Philipp, Karl-Heinz; Riedisser, Gunter; and Voss, Wilfried, 4,295,399, Cl. 83-251.000.

VPI Educational Foundation: *See—*
Moore, W. Edward C.; and Blanks, James A., 4,295,613, Cl. 241-2.000.

Vroomans, Hubertus J., to Stamicarbon, B.V. Vinyl chloride polymer compositions with reduced combustibility and reduced smoke formation under conditions of fire. 4,296,023, Cl. 260-45.75F.

Vulcan Iron Works Inc.: *See—*
Lerch, John A., 4,295,752, Cl. 403-317.000.

Vysoka skola strojni a textilni: *See—*
Pustka, Zdenek; and Krejcir, Oldrich, 4,295,635, Cl. 254-93.0HP.

W. R. Grace & Co.: *See—*
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Wachi, Yasuyuki: *See—*
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Wacker-Chemie GmbH: *See—*
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Weissgerber, Rudolf; Stoll, Alois; Kandler, Herbert; Nunner, Hans-Herbert; Eichelseder, Christine; and Pangeri, Helmut, 4,296,017, Cl. 260-30.60R.

Wada, Yoshimasa; Yamazaki, Sigeki; Kobayashi, Isamu; Haraguchi, Noriyuki; and Fukuda, Minoru. Apparatus for automatically transferring workpieces. 4,295,780, Cl. 414-749.000.

Wade, Philip M.: *See—*
Ashfield, Herbert E.; Horsfall, Harry; and Wade, Philip M., 4,295,530, Cl. 172-7.000.

Wagensonner, Eduard: *See—*
Stemme, Otto; Ruf, Wolfgang; and Wagensonner, Eduard, 4,296,438, Cl. 358-214.000.

Wagner Electric Corporation: *See—*
Falk, Edward J., 4,295,336, Cl. 60-562.000.

Wahle, Hans-Jurgen: *See—*
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Wajima, Motoyo: *See—*
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Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, 4,296,439, Cl. 358-257.000.

Wakai, Katsuro: *See—*
Ishikawa, Sakou; Watanabe, Yutaka; and Wakai, Katsuro, 4,296,494, Cl. 371-13.000.

Wakisaka, Yoshiaki: *See—*
Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, 4,296,443, Cl. 360-10.000.

Wako Pure Chemical Industries, Ltd.: *See—*
Kasahara, Shizuka; Yamanishi, Kazuhiko; Hanada, Toshiro; Tokuda, Kuniaki; and Kobatake, Shinzo, 4,295,853, Cl. 23-230.00B.

Waldhofer, Reinhard, to Krupp-Koppers GmbH. Gas generator for fine-grained coal fuels. 4,295,448, Cl. 122-164.000.

Walin, Gosta. Oil collecting method. 4,295,975, Cl. 210-800.000.

Waller, William E.: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.

Wallner, Felix: *See—*
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.

Walser, Mackenzie, to Johns Hopkins University, The. Mixed salts of essential or semi-essential amino acids and nitrogen-free analogs thereof. 4,296,127, Cl. 424-319.000.

Walter, Wolfgang, to GTE Products Corporation. Fluorescent lamp having high color rendering index. 4,296,353, Cl. 313-487.000.

Walther, Carl K.; and Temme, Karl, to Carl Kurt Walther GmbH & Co. KG. Flap arranged on discharge and separating devices of vibratory abrasive containers. 4,295,300, Cl. 51-163.200.

Walz, Klaus; and Fiegel, Joachim, to Bayer Aktiengesellschaft. Process for dyeing polyamide fibres. 4,295,852, Cl. 8-560.000.

Wambach, Allen D., to General Electric Company. Reinforced thermoplastic polyester compositions having improved high voltage breakdown resistance. 4,296,021, Cl. 260-40.00R.

Wang, Tse L.: *See—*
O'Neil, Joseph T.; Quinn, Thomas M.; and Wang, Tse L., 4,296,282, Cl. 179-99.0LS.

Ward, Henry D., Jr., to Ward Machinery Company, The. Box blank folding apparatus. 4,295,841, Cl. 493-295.000.

Ward Machinery Company, The: *See—*
Bell, Clinton C., 4,295,842, Cl. 493-342.000.
Ward, Henry D., Jr., 4,295,841, Cl. 493-295.000.

Wardwell, Charles R. Frangible bonding using blush lacquer. 4,296,179, Cl. 428-498.000.

Warner, Clifford C. Rock bolt anchor. 4,295,760, Cl. 405-259.000.

Warner, Steven B., to Celanese Corporation. Process for the thermal stabilization of acrylic fibers. 4,295,844, Cl. 8-115.500.

Warren, Henry R., to RCA Corporation. Magnetic recording with reduced cross-talk and interchannel time displacement. 4,296,430, Cl. 358-8.000.

Washington Logging Equipment, Inc.: *See—*
Langford, Frederic E., 4,295,636, Cl. 254-304.000.

Wason, Satish K., to J. M. Huber Corporation. Adsorbents for polyol purification. 4,296,000, Cl. 252-455.00R.

Wasserfaller, Georg. Door lock. 4,295,349, Cl. 70-111.000.

Watanabe, Yutaka: *See—*
Ishikawa, Sakou; Watanabe, Yutaka; and Wakai, Katsuro, 4,296,494, Cl. 371-13.000.

Waterfield Engineering Limited: *See—*
Waterfield, Timothy O. W., 4,295,485, Cl. 137-74.000.

Waterfield, Timothy O. W., to Waterfield Engineering Limited. Diaphragm valve. 4,295,485, Cl. 137-74.000.

Waterman, Fred W.; McCleery, Jerry E.; and McKie, Robert T., to Morrison-Knudsen Co., Inc.; and Railcar Maint. Co. Car repair apparatus. 4,295,427, Cl. 104-32.00R.

Watkins, Hugh: *See—*
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,295,978, Cl. 252-8.900.

Weber, Adolf: *See—*
Rhau, Siegfried; and Weber, Adolf, 4,296,180, Cl. 428-558.000.

Weber, Charles M., to Babcock & Wilcox Company, The. Expanded cooling jacket assembly. 4,295,255, Cl. 29-157.30V.

Weber, Ekkehard: *See—*
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, 4,295,868, Cl. 55-302.000.

Wechsung, Reiner, to Leybold-Heraeus Gesellschaft mit beschrankter Haftung. Method for analyzing organic substances. 4,296,322, Cl. 250-282.000.

Weimer, Dan G.; and Van Ness, Bradford O., to Engineered Systems, Inc. Card reader security system. 4,296,315, Cl. 235-460.000.

Weinberg, Ekkehard: *See—*
Aignesberger, Alois; Lukas, Walter; and Weinberg, Ekkehard, 4,296,089, Cl. 423-555.000.

Weirauch, Donald F., to Texas Instruments Incorporated. Surface acoustic wave sensor. 4,296,347, Cl. 310-313.00B.

Weisenborn, Frank L.; Brown, William E.; and Meyers, Edward, to E. R. Squibb & Sons, Inc. Antibiotic kristenin. 4,296,101, Cl. 424-119.000.

Weisenborn, Frank L.: *See—*
Petrillo, Edward W., Jr.; and Weisenborn, Frank L., 4,296,033, Cl. 260-326.200.

Weiss, Benjamin F. L., to Exploration Company. Streamer bulkhead. 4,296,481, Cl. 367-20.000.

Weiss, Erich; and Ungermann, Dieter, to Boehringer Mannheim. Pipette with elastic bellows. 4,296,071, Cl. 73-864.110.

Weissgerber, Rudolf; Stoll, Alois; Kandler, Herbert; Nunner, Hans-Herbert; Eichelseder, Christine; and Pangeri, Helmut, to Wacker-Chemie GmbH. Graft copolymer pressure-sensitive adhesives, their manufacture and use. 4,296,017, Cl. 260-30.60R.

Weissman, Mark L.: *See—*
Petrow, Henry G.; and Weissman, Mark L., 4,295,985, Cl. 252-105.000.

Welch, Kimo M., to Varian Associates, Inc. Cryogenic pumping apparatus with replaceable pumping surface elements. 4,295,338, Cl. 62-55.500.

Welch, Melvin B.: *See—*
McDaniel, Max P.; and Welch, Melvin B., 4,295,997, Cl. 252-439.000.

Wells, Thomas J., to Leggett & Platt, Incorporated. Coil spring assembly and forming method. 4,295,639, Cl. 267-91.000.

Welsbach Ozone Systems Corporation: *See—*
Sedberry, Donald C., 4,296,397, Cl. 337-199.000.

Wendelboe, Fred E., to Geosource Inc. Dual magnetic drive for gear meters. 4,295,369, Cl. 73-261.000.

Wenk, Erich: *See—*
Koziol, Konrad; and Wenk, Erich, 4,295,942, Cl. 204-96.000.

Wens, Johannes C., to Smit Ovens Nijmegen B.V. System for sealing of kilns. 4,295,824, Cl. 432-115.000.

Wernau, William C., to Pfizer Inc. Xanthomonas bipolymer for use in displacement of oil from partially depleted reservoirs. 4,296,203, Cl. 435-104.000.

Werner, Alfred O.: *See*—
Cummings, J. Francis; and Werner, Alfred O., 4,295,461, Cl. 126-247.000.

Wert, John A.: *See*—
Robertson, Wayne M.; and Wert, John A., 4,295,901, Cl. 148-12.70A.

Werts, Jean P. A. R. J.: *See*—
Bodart, Robert; and Werts, Jean P. A. R. J., 4,296,493, Cl. 370-48.000.

West, Joseph T.: *See*—
Guyer, James M.; and West, Joseph T., 4,296,466, Cl. 364-200.000.

West, Michael A.: *See*—
Haslop, John M.; Knapman, Reginald G.; and West, Michael A., 4,296,326, Cl. 250-372.000.

Westberg, Ake G., to H. L. Plast H. Lundvall AB. Holder for information carriers in strip form. 4,295,288, Cl. 40-16.400.

Western Electric Company, Inc.: *See*—
Doten, Bradford O.; and Svitak, John J., 4,295,596, Cl. 228-180.00A.
Gray, Vincent F., 4,295,696, Cl. 339-17.00C.

Westinghouse Electric Corp.: *See*—
Smith, James D. B.; and Kauffman, Robert N., 4,296,018, Cl. 260-32.8EP.
Sturges, Robert H., Jr., 4,295,740, Cl. 356-152.000.

Weyerhaeuser Company: *See*—
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,925, Cl. 162-19.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,926, Cl. 162-57.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,927, Cl. 162-57.000.

Whipple, Elliot: *See*—
Boulanger, Henry J.; Lowell, Victor; and Whipple, Elliot, 4,296,287, Cl. 200-83.00P.

Whirlpool Corporation: *See*—
Hinkel, Lester H.; and Wolske, Lawrence E., 4,295,233, Cl. 4-619.000.

Whitaker, Roger B.; and Blevins, Charles W., to Dickey-john Corporation. Combine performance monitor. 4,296,409, Cl. 340-684.000.

White, Alan C.: *See*—
Bushnell, Brian J.; Cavalla, John F.; Shepherd, Robin G.; and White, Alan C., 4,296,029, Cl. 260-239.30R.

White, Jeffrey A. Snowmaking nozzle. 4,295,608, Cl. 239-14.000.

White, Michael L., to Magnaflux Corporation. Pentaerythritol in dry developers. 4,295,362, Cl. 73-104.000.

Whitehead, Larry W., to Leggett & Platt, Incorporated. Bed frame. 4,295,234, Cl. 5-184.000.

Whitehead, Paul, to Johnson, Matthey & Co., Limited. Monitoring process and apparatus. 4,296,086, Cl. 423-392.000.

Wiebe, Donald, to A. Stucki Company. Railway truck bolster friction assembly. 4,295,429, Cl. 105-197.0DB.

Wiechert, Rudolf: *See*—
Laurent, Henry; Esperling, Peter; Kapp, Joachim-Friedrich; and Wiechert, Rudolf, 4,296,109, Cl. 424-241.000.

Wiedemann, Rolf: *See*—
Aigle, Karl; Hieber, Udo; Huebscher, Wilhelm; Rheindorf, Hans H.; and Wiedemann, Rolf, 4,296,453, Cl. 361-275.000.

Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Use of isochroman musk compounds in augmenting or enhancing the aroma of dryer-added fabric softener articles. 4,295,978, Cl. 252-8.900.

Wilhelm Schafer Maschinenbau: *See*—
Schafer, August W., 4,295,592, Cl. 228-17.000.

Wilkinson, Stanley B., to General Electric Company. Ultra high speed protective relay circuit. 4,296,451, Cl. 361-80.000.

Wilkinson Sword Limited: *See*—
Roswell, David G.; Spring, David J.; and Hems, Roger, 4,296,255, Cl. 564-215.000.
Rowsell, David G.; Gascoyne, John M.; and Hems, Roger, 4,296,093, Cl. 424-45.000.

William H. Rorer, Inc.: *See*—
Diamond, Julius, 4,296,264, Cl. 570-128.000.

Williams, Donald E.; Robertson, Forrest E.; Gigot, C. Dean; and Gigot, Terry K., to Acra-Plant, Inc. Planter with cooperating trash clearing discs. 4,295,532, Cl. 172-184.000.

Williams, Ralph P.: *See*—
Parlman, Robert M.; and Williams, Ralph P., 4,295,962, Cl. 209-167.000.

Williams, Robert A. Flexible tube terminating means. 4,295,672, Cl. 285-287.000.

Williams, William, to Delta Mouldings (Leicester) Limited. Mould assembly for use in the manufacture of spherical or substantially spherical articles. 4,295,629, Cl. 249-160.000.

Willingham, Wendell D., to Owens-Illinois, Inc. Closure conversion apparatus for existing closure applicating machines. 4,295,320, Cl. 53-201.000.

Willke, Herbert L., Jr.: *See*—
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,295,416, Cl. 98-33.00R.

Wilson, Arthur: *See*—
Lowe, Edward J.; Minshall, Michael W.; and Wilson, Arthur, 4,296,082, Cl. 423-305.000.

Wilson, David S.: *See*—
Hannett, William J.; Brendel, Thomas E.; and Wilson, David S., 4,295,344, Cl. 62-324.500.

Wilson, Richard S.: *See*—
Dennesen, Francis G.; Wilson, Richard S.; Toulan, Roy D., Jr.; and Madnick, Peter, 4,295,277, Cl. 33-181.00R.

Wilson, Robert, to Timex Corporation. Symmetrical horizontal continuous casting. 4,295,516, Cl. 164-464.000.

Wilson, Thomas T., to Epoxon Products, Inc. Combination heat transfer panel and wall shield for use with stoves and other radiant heaters. 4,295,460, Cl. 126-121.000.

Windley, William T., to Du Pont de Nemours, E. I., and Company. Cobulked continuous filament heather yarn method and product. 4,295,329, Cl. 57-245.000.

Wissinger, Waldemar: *See*—
Gauchel, Peter; and Wissinger, Waldemar, 4,296,062, Cl. 264-173.000.

Witkin, Philip M., to Marshall and Williams Company. Dryer range. 4,295,284, Cl. 34-155.000.

"Wohn-Art" Freizeitartikel Gesellschaft m.b.H.: *See*—
Artweger, Wolfgang; and Freller, Walter, 4,295,679, Cl. 296-171.000.

Wojnarowski, Robert J.: *See*—
Eichelberger, Charles W.; Dehn, Rudolph A.; and Wojnarowski, Robert J., 4,296,296, Cl. 219-10.55B.

Wolf, Alvan H.: *See*—
Landay, David L.; and Wolf, Alvan H., 4,295,655, Cl. 280-11.200.

Wolf, Franz J. Two part pressure relief valve. 4,296,186, Cl. 429-54.000.

Wolf, Karlheinz: *See*—
Nonn, Konrad; Wolf, Karlheinz; Haus, Artur; and Hornle, Reinhold, 4,295,849, Cl. 8-524.000.

Wolske, Lawrence E.: *See*—
Hinkel, Lester H.; and Wolske, Lawrence E., 4,295,233, Cl. 4-619.000.

Woltersdorf, Otto W., Jr.: *See*—
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,296,122, Cl. 424-285.000.

Wong, Gim. Programmable electronic starting device for autos and the like with means selectable to actuate accessories. 4,296,334, Cl. 290-37.00R.

Wong, William H., to Bell Telephone Laboratories, Incorporated. Molded circuit retaining enclosure with a receptacle means for securing individual circuit components. 4,296,454, Cl. 361-380.000.

Wood, Donald H.: *See*—
Blake, Charles H.; and Wood, Donald H., 4,296,363, Cl. 318-349.000.

Wood, Douglas E. Parabolic reflector comprising a plurality of triangular reflecting members forming a reflecting surface supported by a framework having a particular geometric pattern. 4,295,709, Cl. 350-292.000.

Wood, Prentice J., to Mead Corporation, The. Article carrier and blank therefor. 4,295,562, Cl. 206-158.000.

Woods, Rodney G.; Clarke, Charles J., Jr.; and Sodergren, Robert C., to Honeywell Inc. Process control system with local microprocessor control means. 4,296,464, Cl. 364-200.000.

Woodstock, Alan: *See*—
Greenwood, Gillian M.; and Woodstock, Alan, 4,295,888, Cl. 106-21.000.

Woolcock, Kenneth W., to Rota Cota Pty. Ltd. Paint roller. 4,295,241, Cl. 15-230.110.

Woolley, Jack: *See*—
Smith, Leslie; Tew, William; and Woolley, Jack, 4,296,458, Cl. 361-433.000.

Worrell, G. Richard, to Atlantic Richfield Company. Tertiary butyl alcohol production. 4,296,263, Cl. 568-910.000.

Worrell, G. Richard: *See*—
Grane, Henry R.; Jubin, John C., J nd Worrell, G. Richard, 4,296,262, Cl. 568-910.000.

Wright, Dale W.: *See*—
Horner, John A.; and Wright, Dale W., 4,296,313, Cl. 235-61.00L.

Wright, Earl R., to Wright Leather Goods Manufacturing Co. Filigreed belt with solid center portion. 4,295,231, Cl. 2-338.000.

Wright Leather Goods Manufacturing Co.: *See*—
Wright, Earl R., 4,295,231, Cl. 2-338.000.

Wright, Ronald F. Truss assembly apparatus. 4,295,269, Cl. 29-798.000.

Wristers, Harry J., to Exxon Research & Engineering Co. Titanium trichloride catalyst component and the process for the production thereof. 4,295,991, Cl. 252-429.00B.

Wu, Che-Kuang, to Corning Glass Works. Method for optical recording in photo-dichroic glass surfaces. 4,296,479, Cl. 365-119.000.

Wuerzer, Bruno: *See*—
Eicken, Karl; Rohr, Wolfgang; Pander, Hans J.; and Wuerzer, Bruno, 4,295,875, Cl. 71-88.000.

Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Heat transfer system. 4,295,520, Cl. 165-41.000.

Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; and Schmidt, Hans-Joachim, to Hoechst Aktiengesellschaft. Process for the manufacture of lower olefins from methanol/water mixtures. 4,296,266, Cl. 585-640.000.

Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for reducing blood pressure in animals. 4,296,119, Cl. 424-274.000.

Wust, Manfred: *See*—
Roman, Alain; Chevreux, Pierre; Wust, Manfred; and Ehretsmann, Jacques, 4,295,948, Cl. 204-159.230.

Wuthrich, Hans-Rudolf; Krebs, Peter; Spiegel, Hubert; and Eicher, Franz, to Sprecher & Schuh AG. Electric gas-blast switch. 4,296,289, Cl. 200-148.00R.

Wynosky, Thomas A.; and Campbell, Charles A., to United Technologies Corporation. Two-dimensional nozzle. 4,295,611, Cl. 239-265.370.

Wyss, Robert P.: *See*—
Narozny, Ronald S.; and Wyss, Robert P., 4,295,704, Cl. 339-99.00R.

Xerox Corporation: *See*—
Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.
Hull, Charles J.; Hutton, James E.; and Mahuson, Teri J., 4,295,732, Cl. 355-14.00R.
Markham, Roger G.; and Skinner, Doyle P., Jr., 4,296,417, Cl. 346-75.000.
Silverberg, Morton, 4,295,737, Cl. 355-76.000.

Yagihara, Morio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,296,199, Cl. 430-551.000.

Yagihara, Morio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,296,200, Cl. 430-551.000.

Yamada, Tateyoshi: *See*—
Hara, Shigeyoshi; and Yamada, Tateyoshi, 4,296,218, Cl. 525-439.000.

Yamagata, Toshio: *See*—
Moriya, Takeo; and Yamagata, Toshio, 4,296,193, Cl. 430-149.000.

Yamaguchi, Takashi; Okuno, Yoshitoshi; and Hirose, Chuji, to Sumitomo Chemical Company, Limited. Insecticidal aerosol formulation having a liquified petroleum gas propellant. 4,295,581, Cl. 222-192.000.

Yamakawa, Norio: *See*—
Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, 4,296,346, Cl. 310-242.000.

Yamamoto, Fujio: *See*—
Kawaguchi, Yasuyosi; Shimotake, Munetoshi; and Yamamoto, Fujio, 4,295,512, Cl. 152-354.00R.

Yamamoto, Noboru: *See*—
Matsuhisa, Tadaaki; Soejima, Shigeo; and Yamamoto, Noboru, 4,295,892, Cl. 501-120.000.

Yamamoto, Seiichi: *See*—
Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, 4,296,439, Cl. 358-257.000.

Yamanishi, Kazuhiko: *See*—
Kasahara, Shizuka; Yamanishi, Kazuhiko; Hanada, Toshiro; Tokuda, Kuniaki; and Kobatake, Shinzo, 4,295,853, Cl. 23-230.00B.

Yamashita, Etsu: *See*—
Nakahama, Syuhei; and Yamashita, Etsu, 4,296,308, Cl. 219-136.000.

Yamazaki, Etuo: *See*—
Imazeki, Ryoji; and Yamazaki, Etuo, 4,296,473, Cl. 364-520.000.

Yamazaki, Hiroshi; and Isayama, Takuro, to Ricoh Company, Ltd. Ink jet printing apparatus with reverse solvent flushing means. 4,296,418, Cl. 346-75.000.

Yamazaki, Sigeki: *See*—
Wada, Yoshimasa; Yamazaki, Sigeki; Kobayashi, Isamu; Haraguchi, Noriyuki; and Fukuda, Minoru, 4,295,780, Cl. 414-749.000.

Yamazaki, Yasuhiro: *See*—
Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, 4,296,439, Cl. 358-257.000.

Yan, Tsoung-yuan, to Mobil Oil Corporation. Method for protecting an ion-exchange resin from chemical poisoning. 4,296,075, Cl. 423-7.000.

Yanabu, Satoru; Mizoguchi, Hitoshi; and Simogawara, Naoaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas insulated disconnecting switches. 4,296,288, Cl. 200-146.00R.

Yano, Yasuhiro: *See*—
Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, 4,295,889, Cl. 106-22.000.

Yarborough, Lyman: *See*—
Sharp, Shelby P.; and Yarborough, Lyman, 4,295,979, Cl. 252-8.55E.

Yashima, Nobuyoshi, to Mitsui Engineering and Shipbuilding Co., Ltd. Working platform for oil drilling operations in ice covered sea areas. 4,295,758, Cl. 405-201.000.

Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, to Nissan Motor Co. Ltd. Exhaust gas recirculation control system for a compression-ignition internal combustion engine. 4,295,455, Cl. 123-569.000.

Yasukawa, Masaru; and Yasukawa, Soji. Conveyor with scrapers. 4,295,561, Cl. 198-735.000.

Yasukawa, Soji: *See*—
Yasukawa, Masaru; and Yasukawa, Soji, 4,295,561, Cl. 198-735.000.

Yeatts, Roy E., to RJR Archer, Inc. Composite tipping structure for use on an air-ventilated cigarette and method of manufacturing same. 4,295,478, Cl. 131-336.000.

Yeda Research and Development Company Ltd.: *See*—
Hodes, Gary; Cahen, David; and Manassen, Joost, 4,296,188, Cl. 429-111.000.

Ygnacio Inc.: *See*—
Holland, Kenneth F., 4,296,431, Cl. 358-12.000.

Yokota, Yukio: *See*—
Yagihara, Morio; and Yokota, Yukio, 4,296,199, Cl. 430-551.000.
Yagihara, Morio; and Yokota, Yukio, 4,296,200, Cl. 430-551.000.

Yonezawa, Seiji: *See*—
Terao, Motoyasu; Shigematsu, Kazuo; Ojima, Masahiro; and Yonezawa, Seiji, 4,296,419, Cl. 346-135.100.

Yoo, Jin S.: *See*—
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masologites, George P., 4,295,858, Cl. 44-1.0SR.

Yoshida, Akio: *See*—
Shimada, Wataru; Hoshinouchi, Susumu; Kawaguchi, Kenji; and Yoshida, Akio, 4,295,906, Cl. 156-214.000.

Yoshida, Isao: *See*—
Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, 4,296,216, Cl. 525-66.000.

Yoshida Kogyo K.K.: *See*—
Hakoi, Tsutomu, 4,295,570, Cl. 209-657.000.

Yoshida, Masakatsu; Tochio, Yoshihiko; and Tohi, Atsutomo, to Matsushita Electronics Corporation. Method of making isolated semiconductor devices utilizing ion-implantation of aluminum and heat treating. 4,295,898, Cl. 148-1.500.

Yoshikawa, Takaharu, to Toshin Kogyo Co. Ltd. Method and apparatus for correcting errors of feeding of endless belt in automatic screen printing. 4,296,365, Cl. 318-632.000.

Yoshizumi, Eizaburo. Ground prospecting method utilizing electrical resistivity measurements for measuring the resistivity of unit blocks of the ground. 4,296,379, Cl. 324-357.000.

Yosim, Samuel J., to Rockwell International Corporation. Method of decladding. 4,296,074, Cl. 423-4.000.

Young, Donald A.; and Squires, Christopher P., to Lucas Industries, Limited. Starter motor. 4,296,342, Cl. 310-77.000.

Yuda, Takuo: *See*—
Morota, Kazutoshi; and Yuda, Takuo, 4,295,618, Cl. 248-73.000.

Yuhara, Akitsuna: *See*—
Hazama, Katashi; and Yuhara, Akitsuna, 4,296,391, Cl. 333-193.000.

Zachmeier, Thomas R. Well boring rigs and spoil handling conveyor apparatus therefor. 4,295,534, Cl. 175-88.000.

Zahid, Abduz, to Greer Hydraulics, Incorporated. Low cost accumulator device. 4,295,492, Cl. 138-30.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Liebert, Karl-Heinz, 4,295,805, Cl. 418-61.00B.

Zahs, Gernot; and Wahle, Hans-Jurgen, to Vacmetal Gesellschaft fur Vakuum-Metallurgie mbH. Rotary pipe switch. 4,295,667, Cl. 285-18.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Okami, Yoshiro; and Kondo, Shinichi, 4,296,106, Cl. 424-181.000.

Zaiser, Wolfgang: *See*—
Helfer, Friedrich; Elsner, Ernst; and Zaiser, Wolfgang, 4,295,348, Cl. 64-27.00L.

Zamek, Otto S.: *See*—
Pauze, Denis R.; and Zamek, Otto S., 4,296,229, Cl. 528-45.000.

Zangari, Dominic V.; and Cranston, Douglas R., to Zangari, Dominic V. Cap lining machine. 4,295,436, Cl. 113-80.00D.

Zaverni, Vikram H.: *See*—
Kluting, Bernd A.; and Zaverni, Vikram H., 4,295,682, Cl. 297-367.000.

Zbranek, Zdenka: *See*—
Heuer, Steven R.; and Zbranek, Zdenka, 4,296,077, Cl. 423-53.000.

Zbrojovka Vsetin: *See*—
Svaty, Vladimir, 4,295,500, Cl. 139-435.000.

Zenith Radio Corporation: *See*—
d'Hautecourt, Alain H.; Bretl, Wayne E.; and Lee, Ronald B., 4,296,435, Cl. 358-166.000.
Engel, Christopher M.; and Srivastava, Gopal K., 4,296,432, Cl. 358-28.000.

Zero-Seal, Inc.: *See*—
Coles, Carl R., 4,295,653, Cl. 277-2.000.

Zhivotov, Jury G. Apparatus for balancing bodies of revolution. 4,295,386, Cl. 74-573.00F.

Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and by Eroshevskaya, Elena D., administrator. Apparatus for balancing bodies of revolution. 4,295,387, Cl. 74-573.00F.

Ziccarelli, Salvatore F.; Ramos, Rey C.; and Brown, Robert M., to Beatrice Foods Company. Coconut powder. 4,296,136, Cl. 426-533.000.

Ziche, Horst, to Henkel Kommanditgesellschaft Auf Aktien. Process for the removal of alkali metal halides from cellulose ethers soluble in cold water and use of the purified products in washing and cleansing agent compositions. 4,296,235, Cl. 536-85.000.

Ziegenhain, William C., to Conoco Inc. Method of making alumina fibers. 4,296,057, Cl. 264-63.000.

Zielke, Rainer; and Maegerlein, Helmut, to Akzona Incorporated. Process for the preparation of phloroglucinol. 4,296,260, Cl. 568-763.000.

Zimmerman, Lawrence. Hay bale stacker. 4,295,772, Cl. 414-38.000.

Zimmermann, Frank; Heidemeyer, Paulus; and Bigalke, Erhard, to Volkswagenwerk Aktiengesellschaft. Automatic clutch system. 4,295,551, Cl. 192-0.076.

Zimmermann, Wolfgang; Schindler, Hermann; and Pospich, Gunther, to Hoechst Aktiengesellschaft. Open-cell shaped article made of acetalized polyvinyl alcohol and process for its manufacture. 4,296,210, Cl. 521-85.000.

Zorbalas, George S., to RCA Corporation. Motor speed control circuit. 4,296,446, Cl. 360-73.000.

Zubkewych, Morris: *See*—
Clark, Eugene A.; and Zubkewych, Morris, 4,295,229, Cl. 2-20.000.

Zura, Boris, to United States of America, Army. Gage to measure track tension. 4,295,379, Cl. 73-862.620.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alfa-Laval AB: *See—*
Stenstrom, Lennart A., Re. 30,780, Cl. 219-10.55M.

Commonwealth Scientific and Industrial Research Organization: *See—*
Plate, Dieter E. A.; and Feehan, John D., Re. 30,776, Cl. 57-86.000.

Cooper, Roydon B., to Pall Corporation. Filter assembly with replaceable filter element. Re. 30,779, Cl. 210-232.000.

Dahlbeck, Edwin L.; and Dahlbeck, Verna H. Lightweight removable cover for a pool, greenhouse or the like. Re. 30,774, Cl. 4-498.000.

Dahlbeck, Verna H.: *See—*
Dahlbeck, Edwin L.; and Dahlbeck, Verna H., Re. 30,774, Cl. 4-498.000.

Delvy, Robert J.: *See—*
Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert J., Re. 30,775, Cl. 29-25.420.

De Mauro, Armando A.: *See—*
Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert J., Re. 30,775, Cl. 29-25.420.

Extraversion, Inc.: *See—*
Ytter, Willy, Re. 30,777, Cl. 160-135.000.

Feehan, John D.: *See—*
Plate, Dieter E. A.; and Feehan, John D., Re. 30,776, Cl. 57-86.000.

Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., to Pennsylvania Crusher Corporation. Crusher-dryer and method of crushing. Re. 30,778, Cl. 241-18.000.

Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert J., to Universal Manufacturing Corporation. Automatic capacitor winding machine and method. Re. 30,775, Cl. 29-25.420.

Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. Logarithmic amplifier. Re. 30,781, Cl. 307-490.000.

Nigro, Joseph P.: *See—*
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., Re. 30,778, Cl. 241-18.000.

Pall Corporation: *See—*
Cooper, Roydon B., Re. 30,779, Cl. 210-232.000.

Pennsylvania Crusher Corporation: *See—*
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., Re. 30,778, Cl. 241-18.000.

Plate, Dieter E. A.; and Feehan, John D., to Commonwealth Scientific and Industrial Research Organization. Break-out apparatus for fault prevention in the production of multi-strand yarns. Re. 30,776, Cl. 57-86.000.

Stenstrom, Lennart A., to Alfa-Laval AB. Heat treatment of heat-sensitive products. Re. 30,780, Cl. 219-10.55M.

Trio Kabushiki Kaisha: *See—*
Miyamoto, Yukihiko, Re. 30,781, Cl. 307-490.000.

Universal Manufacturing Corporation: *See—*
Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert J., Re. 30,775, Cl. 29-25.420.

Wallitsch, Frank, Jr.: *See—*
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., Re. 30,778, Cl. 241-18.000.

Ytter, Willy, to Extraversion, Inc. Portable display system. Re. 30,777, Cl. 160-135.000.

LIST OF DESIGN PATENTEES

Adkinson, Joseph E. Chair or the like. 261,333, 10-20-81, Cl. D6-57.000.

AGFA-Gevaert AG: *See—*
Schlagheck, Norbert, 261,393, Cl. D16-4.000.

Airway Industries, Inc.: *See—*
Davis, Michael, 261,328, Cl. D3-71.000.

Amarger, Guy, to Compagnie Generale des Etablissements Michelin. Tire. 261,380, 10-20-81, Cl. D12-143.000.

Amarger, Guy, to Compagnie Generale des Etablissements Michelin. Tire. 261,381, 10-20-81, Cl. D12-146.000.

Amarger, Guy, to Compagnie Generale des Etablissements Michelin. Tire. 261,383, 10-20-81, Cl. D12-147.000.

Ambler, E. Curtis; and Bies, Sylvester W., to Stanley Works, The. Mitre box. 261,353, 10-20-81, Cl. D8-71.000.

AMC International Alfa Metalcraft Corporation AG: *See—*
Ryser, Theophil, 261,349, Cl. D7-132.000.

Anderson, Charles C. Oropharyngeal airway. 261,442, 10-20-81, Cl. D29-6.000.

Anson, Robert A. Rack for holding dental instruments. 261,424, 10-20-81, Cl. D24-16.000.

Appel, Mel; and Kress, George, to Appel, Mel. Toy kitchen. 261,404, 10-20-81, Cl. D21-122.000.

Aqua-Mist, Inc.: *See—*
Morrow, William B., 261,421, Cl. D23-147.000.
Morrow, William B., 261,422, Cl. D23-147.000.

Ballard, James H. Emergency shelter for underground installation. 261,432, 10-20-81, Cl. D25-36.000.

Barreca, Joseph E., to McGraw-Hill, Inc. Drawing instrument. 261,368, 10-20-81, Cl. D10-62.000.

Barton, Shirley. Vending trailer. 261,431, 10-20-81, Cl. D25-10.000.

Bates Industries, Inc.: *See—*
Beaubien, Thomas S.; Rich, Dennis C.; and Oehring, Robert E., 261,386, Cl. D12-158.000.

Baturin, Peter, to Medical Products Institute Incorporated. Vacuum splint. 261,430, 10-20-81, Cl. D24-64.000.

Bausch & Lomb Incorporated: *See—*
Speaker, Edwin A., 261,397, Cl. D16-131.000.

Beall, Glenn L.; Petersen, Lawrence; and Dauksys, Richard J., to Loctite Puerto Rico. Combined adhesive container and dispenser. 261,400, 10-20-81, Cl. D19-66.000.

Beaubien, Thomas S.; Rich, Dennis C.; and Oehring, Robert E., to Bates Industries, Inc. Motorcycle tote box. 261,386, 10-20-81, Cl. D12-158.000.

Bell, Ted A.; and Cooksey, Timothy S., to Pretty Products, Inc. Tape cassette holder for a sunvisor. 261,326, 10-20-81, Cl. D3-35.000.

Benz, Rolf. Adjustable lounge chair or similar article. 261,331, 10-20-81, Cl. D6-37.000.

Bergeron, Timothy J., to J. A. Preston Corporation. Child's crawler. 261,378, 10-20-81, Cl. D12-128.000.

Bianchi, John E.; and Nichols, Richard D. E. Long barrel holster. 261,409, 10-20-81, Cl. D22-13.000.

Bies, Sylvester W.: *See—*
Ambler, E. Curtis; and Bies, Sylvester W., 261,353, Cl. D8-71.000.

Braun Aktiengesellschaft: *See—*
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,441, Cl. D28-35.000.

Brooksby, Brain T.; Murray, Harold J.; Simpson, Anthony; and Peterkin, Stuart M. Target slide projectors console. 261,395, 10-20-81, Cl. D16-11.000.

Bruhn, John A., to Zimmer USA, Inc. Bone cement injector handpiece. 261,425, 10-20-81, Cl. D24-26.000.

Bryan, John W. Gaff holder for the spur of a gamecock. 261,408, 10-20-81, Cl. D22-1.000.

Cacciatore, Diego M.: *See—*
Weitz, Harry; and Cacciatore, Diego M., 261,387, Cl. D12-192.000.

California Sounds Ltd.: *See—*
Sandor, Joseph, 261,363, Cl. D9-413.000.

Canon Kabushiki Kaisha: *See—*
Hirata, Takashi; and Fushimoto, Hideo, 261,398, Cl. D18-7.000.

Carper, William B., to Suntrak Industries, Inc. Snow scoop body. 261,351, 10-20-81, Cl. D8-10.000.

Carre, Alain, to Waterman S.A. Watch. 261,365, 10-20-81, Cl. D10-38.000.

Catron, George W., to LeSueur, Leo R. Jeans or the like. 261,323, 10-20-81, Cl. D2-28.000.

Catron, George W., to LeSueur, Leo R. Jeans or the like. 261,324, 10-20-81, Cl. D2-28.000.

Champion International Corporation: *See—*
Faller, Rudolph A., 261,358, Cl. D9-346.000.

Clemens, Donald L., to Thermalloy Incorporated. Card ejector handle for a printed circuit board or similar article. 261,354, 10-20-81, Cl. D8-306.000.

Clyburn, Charles W., to James David Incorporated. Furniture leg and rail connector. 261,340, 10-20-81, Cl. D6-191.000.

Coca-Cola Company, The: *See—*
Harvill, William A., 261,390, Cl. D15-116.000.

Collis, Carroll E. Sign post support. 261,401, 10-20-81, Cl. D20-41.000.

Compagnie Generale des Etablissements Michelin: *See—*
Amarger, Guy, 261,380, Cl. D12-143.000.
Amarger, Guy, 261,381, Cl. D12-146.000.
Amarger, Guy, 261,383, Cl. D12-147.000.
Peron, Jean-Claude, 261,379, Cl. D12-143.000.
Peron, Jean-Claude, 261,382, Cl. D12-147.000.
Peron, Jean-Claude, 261,384, Cl. D12-147.000.
Peron, Jean-Claude, 261,385, Cl. D12-147.000.
Conceptual Factors, Inc.: *See—*
Lutz, William R., 261,347, Cl. D7-130.000.
Conner, Marjorie M., to Trigere, Inc. Chair. 261,335, 10-20-81, Cl. D6-72.000.
Cooksey, Timothy S.: *See—*
Bell, Ted A.; and Cooksey, Timothy S., 261,326, Cl. D3-35.000.
Corbin, Gary L. Skate wheel. 261,406, 10-20-81, Cl. D21-226.000.
Cornelius Company, The: *See—*
Harvill, William A., 261,390, Cl. D15-116.000.
Ranua, Walter E.; and Mackrell, William B., 261,391, Cl. D15-120.000.
Dart Industries Inc.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,348, Cl. D7-131.000.
Dauksys, Richard J.: *See—*
Beall, Glenn L.; Petersen, Lawrence; and Dauksys, Richard J., 261,400, Cl. D19-66.000.
Davis, Michael, to Airway Industries, Inc. Luggage case. 261,328, 10-20-81, Cl. D3-71.000.
DeLange, William. Wall-mounted mailbox. 261,443, 10-20-81, Cl. D99-33.000.
Doi, Tetsuyuki; and Shohoji, Takeshi, to Ryobi Limited. Fishing rod grip. 261,411, 10-20-81, Cl. D22-23.000.
Doonan, R. Dean. Insulation injection hole plug. 261,357, 10-20-81, Cl. D8-499.000.
Eberle, Gunter F., to Vecta Contract, Inc. Base for a table or the like. 261,341, 10-20-81, Cl. D6-196.000.
Eddleman, Roy T. Vacuum filter. 261,413, 10-20-81, Cl. D23-4.000.
Englishtown Sportswear, Ltd.: *See—*
Heinfling, Martin, 261,320, Cl. D2-25.000.
Heinfling, Martin, 261,321, Cl. D2-25.000.
Heinfling, Martin, 261,322, Cl. D2-25.000.
Epperson, Charles N., to Invention Development Equity Assoc., Inc. Container for liquids or the like. 261,360, 10-20-81, Cl. D9-375.000.
Epperson, Charles N., to Invention Development Equity Assoc., Inc. Container for liquid products or the like. 261,361, 10-20-81, Cl. D9-375.000.
Epperson, Charles N., to Invention Development Equity Assoc., Inc. Stackable container for liquids or the like. 261,362, 10-20-81, Cl. D9-376.000.
Faller, Rudolph A., to Champion International Corporation. Blank for three compartment box. 261,358, 10-20-81, Cl. D9-346.000.
Fink, Raymond W., to Tool Dynamics, Inc. Auxiliary towel rack. 261,337, 10-20-81, Cl. D6-99.000.
Fisher, Stanley C. Light-reflecting sculpture. 261,373, 10-20-81, Cl. D11-131.000.
Flexsteel Industries, Inc.: *See—*
Meier, Louis M., 261,330, Cl. D6-37.000.
Fraze, Ermal C.: *See—*
Smyth, George F., 261,364, Cl. D9-438.000.
Free, John H.: *See—*
Groh, Leo A.; Ludwig, Douglas D., Painter, David L.; and Free, John H., 261,348, Cl. D7-131.000.
Fried, Leo A. Earring. 261,372, 10-20-81, Cl. D11-40.000.
Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Klose, Odo, 261,417, Cl. D23-35.000.
Frye, Stephen K., to Lion in Frost Inc. Table base. 261,342, 10-20-81, Cl. D6-196.000.
Fushimoto, Hideo: *See—*
Hirata, Takashi; and Fushimoto, Hideo, 261,398, Cl. D18-7.000.
Geissler, Hans-Jurgen, to Rowenta-Werke, GmbH. Denture cleaner or the like. 261,423, 10-20-81, Cl. D24-10.000.
Geissler, Udo M., to Plaubel, Feinmechanik & Optik GmbH. Camera. 261,394, 10-20-81, Cl. D16-06.000.
General Bathroom Products Co.: *See—*
Palka, James J.; and Rekart, Robert, 261,436, Cl. D26-80.000.
Gibiec, Oswald, to Vorwerk & Co. Elektrowerke KG. Basket insert for a kitchen machine. 261,343, 10-20-81, Cl. D7-47.000.
Grant, Benton H. Tub mounted bath lift. 261,377, 10-20-81, Cl. D34-33.000.
Greubel, Jurgen: *See—*
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,441, Cl. D28-35.000.
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., to Dart Industries Inc. Ribbed coffee urn lid. 261,348, 10-20-81, Cl. D7-131.000.
Hanna-Burns, Joan. Bed pan seat liner. 261,429, 10-20-81, Cl. D24-51.000.
Harvill, William A., to Coca-Cola Company, The; and Cornelius Company, The. Beverage dispenser. 261,390, 10-20-81, Cl. D15-116.000.
Hayes, Jerry R., to L. R. Nelson Corporation. Sprinkler base. 261,414, 10-20-81, Cl. D23-7.000.
Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 261,320, 10-20-81, Cl. D2-25.000.
Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 261,321, 10-20-81, Cl. D2-25.000.
Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 261,322, 10-20-81, Cl. D2-25.000.
Hirata, Takashi; and Fushimoto, Hideo, to Canon Kabushiki Kaisha. Desk top electronic calculator. 261,398, 10-20-81, Cl. D18-7.000.
Instrument Systems Corporation: *See—*
Weitz, Harry; and Cacciatore, Diego M., 261,387, Cl. D12-192.000.
Invention Development Equity Assoc., Inc.: *See—*
Epperson, Charles N., 261,360, Cl. D9-375.000.
Epperson, Charles N., 261,361, Cl. D9-375.000.
Epperson, Charles N., 261,362, Cl. D9-376.000.
J. A. Preston Corporation: *See—*
Bergeron, Timothy J., 261,378, Cl. D12-128.000.
Jackson, Edward. Combined strainer and plug for a sink or the like. 261,418, 10-20-81, Cl. D23-42.000.
James David Incorporated: *See—*
Clyburn, Charles W., 261,340, Cl. D6-191.000.
Janson, Mats, to Tylo Sauna S.A. Front cover for thermostat regulator housing. 261,367, 10-20-81, Cl. D10-60.000.
John J. Madison Company, Inc.: *See—*
Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., 261,374, Cl. D11-158.000.
Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., 261,375, Cl. D11-158.000.
Johnson, Kenneth E., Sr., to T-Shirts Plus, Inc. Display stand. 261,339, 10-20-81, Cl. D6-152.000.
Kikuchi, Yoshikazu, to Mitutoyo Mfg. Co., Ltd. Dial gauge. 261,370, 10-20-81, Cl. D10-73.000.
Klose, Odo, to Friedrich Grohe Armaturenfabrik GmbH & Co. Showerhead. 261,417, 10-20-81, Cl. D23-35.000.
Koeppel, Fritz; and Loizance, Jean-Yves. Decanting cradle. 261,345, 10-20-81, Cl. D7-70.000.
Koshiyama, Taro. Clothes dryer rack. 261,350, 10-20-81, Cl. D32-58.000.
Kress, George: *See—*
Appel, Mel; and Kress, George, 261,404, Cl. D21-122.000.
L. R. Nelson Corporation: *See—*
Hayes, Jerry R., 261,414, Cl. D23-7.000.
Lam, Yanta H. T., to Meyer Aluminium Limited. Microwave detector. 261,366, 10-20-81, Cl. D10-47.000.
LeSueur, Leo R.: *See—*
Catron, George W., 261,323, Cl. D2-28 000.
Catron, George W., 261,324, Cl. D2-28.000.
Lewis, Kenneth T. Burglar alarm housing. 261,371, 10-20-81, Cl. D10-106.000.
Light, Rex E. Seat. 261,334, 10-20-81, Cl. D6-63.000.
Lion in Frost Inc.: *See—*
Frye, Stephen K., 261,342, Cl. D6-196.000.
Loctite Puerto Rico: *See—*
Beall, Glenn L.; Petersen, Lawrence; and Dauksys, Richard J., 261,400, Cl. D19-66.000.
Loizance, Jean-Yves: *See—*
Koeppel, Fritz; and Loizance, Jean-Yves, 261,345, Cl. D7-70.000.
Lovejoy, Robert B., to Mattel, Inc. Basketball game display and control panel or similar article. 261,402, 10-20-81, Cl. D21-13.000.
Ludwig, Douglas D.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,348, Cl. D7-131.000.
Lutz, William R., to Conceptual Factors, Inc. Pot stand assembly for a portable camp stove. 261,347, 10-20-81, Cl. D7-130.000.
Maass, Rudolf, to Robert Krups Stiftung & Co. KG. Wall-hung coffee machine. 261,344, 10-20-81, Cl. D7-62.000.
Mackrell, William B.: *See—*
Ranua, Walter E.; and Mackrell, William B., 261,391, Cl. D15-120.000.
Marconi, Karen D., to Quaker Oats Company, The. Toy rabbit. 261,405, 10-20-81, Cl. D21-187.000.
Marlin Fiberglass, Inc.: *See—*
Reineman, Richard G., 261,426, Cl. D24-38.000.
Mattel, Inc.: *See—*
Lovejoy, Robert B., 261,402, Cl. D21-13.000.
McGraw-Hill, Inc.: *See—*
Barreca, Joseph E., 261,368, Cl. D10-62.000.
Medical Products Institute Incorporated: *See—*
Baturin, Peter, 261,430, Cl. D24-64.000.
Meier, Louis M., to Flexsteel Industries, Inc. Chair. 261,330, 10-20-81, Cl. D6-37.000.
Meyer Aluminium Limited: *See—*
Lam, Yanta H. T., 261,366, Cl. D10-47.000.
Miller, Grover A. Rotatable tie rack. 261,338, 10-20-81, Cl. D6-113.000.
Miller, Louis E. Guide wheel for welding torches. 261,352, 10-20-81, Cl. D8-30.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Kikuchi, Yoshikazu, 261,370, Cl. D10-73.000.
Miyakawa, Eiji, to Miyakawa Industry Company, Limited. Spindlecase attachment for tapping machines to change the rotation of the tool. 261,392, 10-20-81, Cl. D15-140.000.
Miyakawa Industry Company, Limited: *See—*
Miyakawa, Eiji, 261,392, Cl. D15-140.000.
Moreland, Gerald W. Safety suction fitting for hydro-therapy spas. 261,419, 10-20-81, Cl. D23-42.000.
Morrow, William B., to Aqua-Mist, Inc. Humidifier for a hot air furnace or the like. 261,421, 10-20-81, Cl. D23-147.000.
Morrow, William B., to Aqua-Mist, Inc. Humidifier for a hot air furnace or the like. 261,422, 10-20-81, Cl. D23-147.000.
Moss, Charles W. Shelter. 261,407, 10-20-81, Cl. D21-253.000.
Mullins, Dewey C., to Mullins Lure Company. Fishing lure. 261,410, 10-20-81, Cl. D22-29.000.

Mullins Lure Company: *See—*
Mullins, Dewey C., 261,410, Cl. D22-29.000.
Munch, Emil L., to Nestier Corporation. Bakery tray. 261,444, 10-20-81, Cl. D34-43.000.
Murray, Harold J.: *See—*
Brooksby, Brain T.; Murray, Harold J.; Simpson, Anthony; and Peterkin, Stuart M., 261,395, Cl. D16-11.000.
Nass, Henry E. Package of block-shaped articles. 261,359, 10-20-81, Cl. D9-337.000.
Nestier Corporation: *See—*
Munch, Emil L., 261,444, Cl. D34-43.000.
Nichols, Richard D. E.: *See—*
Bianchi, John E.; and Nichols, Richard D. E., 261,409, Cl. D22-13.000.
Niro, Brian G. Shoe. 261,325, 10-20-81, Cl. D2-309.000.
Noble, Edward D. Chiropractic vibrator. 261,428, 10-20-81, Cl. D24-41.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, to Braun Aktiengesellschaft. Curling iron. 261,441, 10-20-81, Cl. D28-35.000.
Oehring, Robert E.: *See—*
Beaubien, Thomas S.; Rich, Dennis C.; and Oehring, Robert E., 261,386, Cl. D12-158.000.
Ofrex Group Limited: *See—*
Robinson, Douglas, 261,356, Cl. D8-382.000.
Ogden, Philip I. Whirlpool bathtub. 261,427, 10-20-81, Cl. D24-38.000.
Ohmura, Ryuichi. Line guide for fishing rod. 261,412, 10-20-81, Cl. D22-24.000.
Owens-Corning Fiberglas Corporation: *See—*
Weitzman, Mark R., 261,435, Cl. D25-97.000.
Painter, David L.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,348, Cl. D7-131.000.
Palka, James J.; and Rekart, Robert, to General Bathroom Products Co. Lighting fixture. 261,436, 10-20-81, Cl. D26-80.000.
Pasquarello, Edward J. Shampoo drainage tray. 261,440, 10-20-81, Cl. D28-20.000.
Pataki, Joseph. Toy hoop roller. 261,403, 10-20-81, Cl. D21-101.000.
Peron, Jean-Claude, to Compagnie Generale des Etablissements Michelin. Tire. 261,379, 10-20-81, Cl. D12-143.000.
Peron, Jean-Claude, to Compagnie Generale des Etablissements Michelin. Tire. 261,382, 10-20-81, Cl. D12-147.000.
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CLASSIFICATION OF PATENTS

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86.41 4,296,304
101 4,296,305
121 ED 4,296,307
124.34 4,296,306
136 4,296,308
216 4,296,309
440 4,296,310
464 4,296,311
501 4,296,312

CLASS 220

2.1 A 4,295,574
3.92 4,295,575
21 4,295,576
86 AT 4,295,577
234 4,295,578

CLASS 221

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268 4,295,580

CLASS 222

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213 4,295,582
478 4,295,583
519 4,295,584

CLASS 223

96 4,295,585

CLASS 224

32 R 4,295,586
321 4,295,587
4,295,588

CLASS 226

122 4,295,589
183 4,295,590

CLASS 227

142 4,295,591

CLASS 228

17 4,295,592
50 4,295,593
160 4,295,594
161 4,295,595
180 A 4,295,596

CLASS 229

2.5 EC 4,295,597
34 R 4,295,599
52 AL 4,295,598

CLASS 233

7 4,295,600
26 4,295,601

CLASS 235

61 L 4,296,313
92 SB 4,296,314
460 4,296,315

CLASS 236

1 G 4,295,603
21 R 4,295,604
56 4,295,605
93 B 4,295,602

CLASS 237

12.1 4,295,606

CLASS 239

1 4,295,607
14 4,295,608
29 4,295,609
230 4,295,610
265.37 4,295,611
310 4,295,612

CLASS 241

2 4,295,613
18 Re.30,778
34 4,295,614
182 4,295,615
241 4,295,616

CLASS 244

3.29 4,295,617

CLASS 248

73 4,295,618
95 4,295,619
154 4,295,620
183 4,295,621
313 4,295,622
456 4,295,623
4,295,624
466 4,295,625
575 4,295,626
588 4,295,627

CLASS 249

80 4,295,628
160 4,295,629

CLASS 250

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215 4,296,317
225 4,296,318
227 4,296,319
252 4,296,320
254 4,296,321
282 4,296,322
289 4,296,323
339 4,296,324
347 4,296,325
372 4,296,326
423 R 4,296,327
436 4,296,328
491 4,296,329
504 R 4,296,330
551 4,296,331
570 4,296,332
572 4,296,333

CLASS 251

14 4,295,630
30 4,295,631
127 4,295,632
172 4,295,633

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8.55 D 4,295,980
8.55 E 4,295,979
8.9 4,295,976
4,295,977
4,295,978
4,295,981
33.4 4,295,982
42 4,295,983
49.6 4,295,984
62 4,295,985
105 4,295,986
188 4,295,987
194 4,295,989
301.4 F 4,295,990
408 4,295,991
429 B 4,295,992
429 C 4,295,993
430 4,295,994
431 C 4,295,995
4,295,996
439 4,295,997
4,295,998
455 R 4,295,999
4,296,000
458 4,296,001
518 4,296,002
570 4,296,003
584 4,295,988

CLASS 254

10.5 4,295,634
93 HP 4,295,635
304 4,295,636

CLASS 256

13.1 4,295,637
59 4,295,638

CLASS 260

18 EP 4,296,004
4,296,005
23 EP 4,296,006
23.7 N 4,296,007
27 BB 4,296,008
28.5 R 4,296,009
29.2 TN 4,296,010
29.3 4,296,011
29.6 ME 4,296,015
29.6 NR 4,296,014
29.6 SQ 4,296,016
29.6 TA 4,296,013
29.6 XA 4,296,012
30.6 R 4,296,017
32.8 EP 4,296,018
33.4 R 4,296,019
37 N 4,296,020
40 R 4,296,021
42.46 4,296,022
45.75 F 4,296,023
112 B 4,296,024
4,296,027
112 R 4,296,025
123.5 4,296,026
160 4,296,028
239 A 4,296,030
239.3 D 4,296,031
239.3 R 4,296,029
245.2 R 4,296,032
326.2 4,296,033
326.82 4,296,034
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340.7 4,296,036
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343.45 4,296,039
343.6 4,296,037
345.2 4,296,040
4,296,041
345.9 R 4,296,042
352 4,296,043
381 4,296,044
448 R 4,296,045
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974 4,296,047

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112 4,296,050

CLASS 264

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26 4,296,053
45.3 4,296,054
45.5 4,296,055
49 4,296,056
63 4,296,057
78 4,296,058
118 4,296,051
130 4,296,059
137 4,296,060
138 4,296,061
173 4,296,062
273 4,296,063
322 4,296,064
325 4,296,065

CLASS 267

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CLASS 269

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136 4,295,641

CLASS 270

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57 4,295,643
60 4,295,644

CLASS 271

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CLASS 272

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CLASS 273

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121 D 4,295,651
235 R 4,295,652

CLASS 277

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CLASS 280

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CLASS 283

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CLASS 285

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14 4,295,666
18 4,295,667
21 4,295,668
47 4,295,669
91 4,295,670
223 4,295,671
287 4,295,672

CLASS 290

37 R 4,296,334

CLASS 292

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190 4,295,674
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262 4,295,676

CLASS 294

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CLASS 296

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171 4,295,679

CLASS 297

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284 4,295,681
367 4,295,682
377 4,295,683
475 4,295,684

CLASS 301

37 P 4,295,685
63 DD 4,295,686

CLASS 303

20 4,295,687

CLASS 307

200 B 4,296,335
300 4,296,336
356 4,296,337
362 4,296,338
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490 Re.30,781
550 4,296,340

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4,295,690
238 4,295,691

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219 4,296,345
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334 4,296,348
335 4,296,349

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257 R 4,295,693

CLASS 313

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632 4,296,365
793 4,296,366
808 4,296,367

CLASS 322

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CLASS 323

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CLASS 324

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71 EB 4,296,372
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313 4,296,378
357 4,296,379

CLASS 328

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CLASS 330

149 4,296,381
264 4,296,382
301 4,296,383

CLASS 331

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90 4,296,385
94.5 H 4,296,386
4,296,387
94.5 L 4,296,388

CLASS 333

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182 4,296,390
193 4,296,391
213 4,296,392

CLASS 335

125 4,296,393
207 4,296,394

CLASS 336

60 4,296,395

CLASS 337

66 4,296,396
199 4,296,397
297 4,296,398

CLASS 338

34 4,296,399

CLASS 339

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17 F 4,295,695
22 R 4,295,697
59 R 4,295,698
61 M 4,295,699
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220 R 4,295,705

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147 P 4,296,403
149 A 4,296,404
166 R 4,296,406
347 CC 4,296,407
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686 4,296,410
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870.19 4,296,412
870.38 4,296,413

CLASS 343

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792.5 4,296,416

CLASS 346

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4,296,418
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4,296,423

CLASS 350

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289 4,295,708
292 4,295,709
310 4,295,710
334 4,295,711

344 4,295,712

CLASS 352

235 4,295,713

CLASS 354

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14 SH 4,295,733
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CLASS 358

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166 4,296,435
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293 4,296,441

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135 4,296,448

CLASS 361

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50 4,296,450
80 4,296,451
82 4,296,452
275 4,296,453
380 4,296,454
383 4,296,455
403 4,296,456
413 4,296,457
433 4,296,458

CLASS 362

104 4,296,459
200 4,296,460

CLASS 363

22 4,296,461
96 4,296,462

CLASS 364

200 4,296,463
4,296,464
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4,296,466
4,296,467
4,296,468
4,296,469
4,296,470
424 4,296,471
509 4,296,472
520 4,296,473
560 4,296,474
900 4,296,475
4,296,476
4,296,477

CLASS 365

112 4,296,478
119 4,296,479
222 4,296,480

CLASS 366

3 4,295,744
302 4,295,745

CLASS 367

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20 4,296,481
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91 4,296,482
140 4,296,486
169 4,296,487

CLASS 368

80 4,296,488
87 4,296,490
205 4,296,489

CLASS 369

59 4,296,491

CLASS 370

14 4,296,492
48 4,296,493

CLASS 371

13 4,296,494
22 4,296,495

CLASS 376

203 4,295,934
285 4,295,935

CLASS 400

119 4,295,746

CLASS 402

75 4,295,747

CLASS 403

24 4,295,748
211 4,295,749
259 4,295,750
306 4,295,751
317 4,295,752
365 4,295,753
369 4,295,754

CLASS 405

66 4,295,755
70 4,295,756
163 4,295,757
201 4,295,758
243 4,295,759
259 4,295,760
261 4,295,761
264 4,295,762

CLASS 408

86 4,295,763

CLASS 409

296 4,295,764

CLASS 410

101 4,295,765

CLASS 411

113 4,295,766
377 4,295,767
387 4,295,768
411 4,295,769
531 4,295,770

CLASS 414

5 4,295,771
38 4,295,772
187 4,295,773
331 4,295,774
375 4,295,775
405 4,295,776
458 4,295,777
525 R 4,295,778
685 4,295,779
749 4,295,780

CLASS 415

1 4,295,781
4,295,782
2 R 4,295,783
162 4,295,784
174 4,295,785
4,295,786
197 4,295,787
202 4,295,788

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226 4,295,790
241 B 4,295,791

CLASS 417

15 4,295,792
36 4,295,793
62 4,295,794
111 4,295,795
115 4,295,796
203 4,295,797
212 4,295,798
240 4,295,799
333 4,295,800
397 4,295,801
405 4,295,802
423 R 4,295,803

CLASS 418

15 4,295,804
61 B 4,295,805
97 4,295,806
170 4,295,807

CLASS 422

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26 4,296,067
62 4,296,068
64 4,296,069
65 4,296,070
254 4,296,072

CLASS 423

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4 4,296,074
7 4,296,075
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4,296,077
240 4,296,078
242 4,296,079
244 4,296,080
245 4,296,081
305 4,296,082
329 4,296,083
351 4,296,084
359 4,296,085
392 4,296,086
449 4,296,087
533 4,296,088
555 4,296,089

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11 4,296,090
18 4,296,091
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45 4,296,093
49 4,296,094
52 4,296,095
4,296,096
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94 4,296,098
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108 4,296,100
119 4,296,101
130 4,296,102
4,296,103
153 4,296,104
180 4,296,105
4,296,107
181 4,296,106
210 4,296,108
241 4,296,109
244 4,296,110
246 4,296,111
4,296,112
4,296,113
248.52 4,296,114
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272 4,296,116
273 B 4,296,117
273 P 4,296,118
274 4,296,119
4,296,120
275 4,296,121
285 4,296,122
4,296,124
287 4,296,123
309 4,296,128
4,296,129
315 4,296,125
316 4,296,126
319 4,296,127
337 4,296,130
347 4,296,131

CLASS 425

8 4,295,808
72 S 4,295,809
110 4,295,810
112 4,295,811
114 4,295,812
121 4,295,813
517 4,295,814
556 4,295,815

CLASS 426

2 4,296,132
23 4,296,133
250 4,296,134
275 4,296,135
533 4,296,136
534 4,296,137
4,296,138
536 4,296,139
575 4,296,140
613 4,296,141

CLASS 427

28 4,296,142
38 4,296,143
4,296,144
47 4,296,145
58 4,296,146
120 4,296,147
125 4,296,148
130 4,296,149
164 4,296,150
255.1 4,296,151
440 4,296,152
444 4,296,153

CLASS 428

15 4,296,154
31 4,296,155
35 4,296,156
36 4,296,157
65 4,296,158
95 4,296,159
117 4,296,160
171 4,296,161
212 4,296,163
213 4,296,162
219 4,296,164
264 4,296,165
283 4,296,166
284 4,296,167
288 4,296,168
298 4,296,169
313 4,296,170
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331 4,296,172
378 4,296,173
389 4,296,174
398 4,296,175
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558 4,296,180
626 4,296,181
629 4,296,182
653 4,296,183

CLASS 429

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48 4,296,185
54 4,296,186
105 4,296,187
111 4,296,188

CLASS 430

5 4,296,189
57 4,296,190
4,296,191
109 4,296,192
149 4,296,193
176 4,296,194
215 4,296,195
271 4,296,196
300 4,296,197
403 4,296,198
551 4,296,199
4,296,200

CLASS 431

4 4,295,816
7 4,295,817
4,295,818
143 4,295,819
191 4,295,820
353 4,295,821

CLASS 432

29 4,295,822
106 4,295,823
115 4,295,824
116 4,295,825
185 4,295,826

CLASS 433

81 4,295,827
90 4,295,828
99 4,295,829
115 4,295,830

CLASS 434

118 4,295,831
168 4,295,832

CLASS 435

7 4,296,201
29 4,296,202
104 4,296,203
235 4,296,204
240 4,296,205
4,296,206

CLASS 440

63 4,295,833
76 4,295,834
78 4,295,835

CLASS 455

1 4,296,496

CLASS 474

51 4,295,836
83 4,295,383
153 4,295,837

CLASS 493

105 4,295,838
143 4,295,839
278 4,295,840
295 4,295,841
342 4,295,842
354 4,295,843

CLASS 501

90 4,295,890
99 4,295,891
120 4,295,892

CLASS 521

53 4,296,207
77 4,296,208
85 4,296,209
4,296,210
154 4,296,211
163 4,296,212
166 4,296,213

CLASS 525

2 4,296,214
28 4,296,215
66 4,296,216
390 4,296,217
439 4,296,218
488 4,296,219
507 4,296,220

CLASS 526

87 4,296,221
119 4,296,222
125 4,296,223
243 4,296,224
260 4,296,225
316 4,296,226
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CLASS 528

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45 4,296,229
67 4,296,230
93 4,296,231
179 4,296,232

CLASS 536

5 4,296,233
47 4,296,234
85 4,296,235

CLASS 542

420 4,296,236

CLASS 544

405 4,296,237

CLASS 546

97 4,296,238
271 4,296,239

CLASS 556

406 4,296,240

CLASS 560

124 4,296,241
160 4,296,242
210 4,296,243

CLASS 562

470 4,296,244
494 4,296,245
503 4,296,246
4,296,247
4,296,248
4,296,249
4,296,250
506 4,296,251

CLASS 564

70 4,296,252
153 4,296,253
214 4,296,254
215 4,296,255

CLASS 568

330 4,296,256
361 4,296,257
364 4,296,258
378 4,296,259
763 4,296,260
890 4,296,261
910 4,296,262
4,296,263

CLASS 570

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138 4,296,265

CLASS 585

640 4,296,266

CLASSIFICATION OF DESIGNS

D2—	25	261,320		196	261,341		413	261,363			261,385		226	261,406			261,427
		261,321			261,342		438	261,364		158	261,386		253	261,407		41	261,428
		261,322	D7—	47	261,343	D10—	38	261,365		192	261,387	D22—	1	261,408		51	261,429
	28	261,323		62	261,344		47	261,366	D14—	25	261,388		13	261,409		64	261,430
		261,324		70	261,345		60	261,367	D15—	112	261,389		23	261,411	D25—	10	261,431
	309	261,325		101	261,346		62	261,368		116	261,390		24	261,412		36	261,432
D3—	35	261,326		130	261,347		69	261,369		120	261,391		29	261,410		50	261,433
	36	261,327		131	261,348		73	261,370		140	261,392	D23—	3	261,415			261,434
	71	261,328		132	261,349		106	261,371	D16—	4	261,393		4	261,413		97	261,435
D6—	30	261,329	D8—	10	261,351	D11—	40	261,372		06	261,394		7	261,414	D26—	80	261,436
	37	261,330		30	261,352		131	261,373		11	261,395		34	261,416		87	261,437
		261,331		71	261,353		158	261,374		35	261,396		35	261,417	D27—	03	261,438
	55	261,332		306	261,354			261,375		131	261,397		42	261,418			261,439
	57	261,333		331	261,355	D12—	1	261,376	D18—	7	261,398			261,419	D28—	20	261,440
	63	261,334		382	261,356		128	261,378		10	261,399		59	261,420		35	261,441
	72	261,335		499	261,357		143	261,379	D19—	66	261,400		147	261,421	D29—	6	261,442
	79	261,336	D9—	337	261,359			261,380	D20—	41	261,401			261,422	D32—	58	261,350
	99	261,337		346	261,358		146	261,381	D21—	13	261,402	D24—	10	261,423	D34—	33	261,377
	113	261,338		375	261,360		147	261,382		101	261,403		16	261,424		43	261,444
	152	261,339			261,361			261,383		122	261,404		26	261,425	D99—	33	261,443
	191	261,340		376	261,362			261,384		187	261,405		38	261,426			

CLASSIFICATION OF PLANTS

P.—	43	4,780	68	4,778	4,779			

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
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Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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